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ABSTRACT

Carpentry Reading Strategies is one of five instructional guides in the Reading Strategies in Vocational Education Series. Developed to assist teachers working with students considered disadvantaged because of reading deficiency, the guide contains several strategies, suitable for adaptation, specifically related to carpentry instruction. Each of six sections into which the guide is divided contains informational material and extensive examples and exercises. Section 1 concerns readability and gives procedures and guidelines for how many samples to collect and how to collect them. Section 2 briefly describes the Cloze procedure and its usefulness as a reading test and as a teaching technique for the theory of case grammar. The following four sections each present a set of important reading skills: Basic Vocabulary Skills, Paragraph Comprehension, SQ4R (Survey, Question, Read, Record, Recite, Review), and Recognizing and Recording Complex Information. Each skill is broken down into segments requiring no more than 5-10 minutes of class time every other day. Home work utilizes text assignments normally required. Following individual skill discussions is the part, Textbook Application, where each skill is applied to the course's own textbook. Each section ends with additional suggestions for teaching the new skills. (A time frame is provided for teaching the skills.) (YLB)

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CARPENTRY
READING STRATEGIES

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1980

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FORWARD

Education amendments in 1976 (P.L. 94-482) provide for special assistance to a wide variety of students with "special needs." The special needs of these students are derived from conditions of the students which are believed to inhibit success in vocational programs. Both handicapped and disadvantaged individuals are to be served by the legislative provisions.

Academically disadvantaged students are those individuals who, becuase of math, reading, or communication deficiencies, may not be able to succeed in vocational programs. Legislation has provided for research and development projects to address the needs of these individuals. The projects in progress have been designed to respond to that call for research and development.

This instructional guide was developed for the purpose of assisting Carpentry teachers in their work with students who are considered disadvantaged because of reading deficiency. It was developed as a result of vocational reading research at The Pennsylvania State University. The guide is intended to be presented at workshops in 1980 funded by the Pennsylvania Department of Education.

"Carpentry Reading Stretegies" have been developed according to certain distinct characteristics of reading requirements in vocational education:

(1) Reading is a vocational skill, one that requires reading abilities that differ from those associated with general literacy.

(2) There is a difference between curricular literature (textbooks and other literature which must be read in the context of student status) and occupational literature (manufacturers instructions, codes, specifications, safety warnings, etc.).

(3) Occupational reading skills are appropriately addressed in the vocational curriculum.

(4) There are strategies available to vocational teachers which need little or no reading specialization.

(5) Available strategies reflect the unique qualities of vocational reading, address general vocational reading skill requirements, and are useful for helping students disadvantaged because of reading deficiencies.

This guide is NOT intended to be envisioned as the final word in reading strategies. It contains examples of several strategies believed to be useful for the vocational instructor seeking methods that are specifically related to carpentry instruction. The instructors are responsible for taking these examples and applying them to their occupational specialties. Not all of the methods will work for all carpentry teachers or their respective students. The methods were designed to be adapted, not rigidly adhered to.

Companion R & D projects at Penn State will provide useful complementary aids. An Employability Skills Curriculum Guide (Wircenski, McPherson, Feng, 1980) will soon be available. That guide addresses socialization, financial management, values clarification, job procurement, and communication skills. Four other occupational specialties (Cosmetology, Data Processing, Medical Assisting, and Radio and Television) will be the bases for reading strategy guides (Thornton, 1980). These guides will focus more specifically on the individual occupational areas utilizing a format similar to the Carpentry guide.

Field testing during 1980-81 school year is expected to result in additional refinements of the several reading strategies. Criticism and recommendations are invited by all who receive these materials. Correspondence should be addressed to:

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L. Jay Thornton
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1980

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Fifteen Area Vocational-Technical Schools in the Center Region of Pennsylvania participated in the development of the series. Scores of manufacturers, publishers, and employers provided literature and information. A listing of the schools, manufacturers, publishers, and employers follows. The project would have been impossible without their help.

Two research efforts provided considerable information toward the development of the series. The first, Basic Reading Skills and Vocational Education, was published by The National Center for Research In Vocational Education under the auspices of the Knowledge Transformation Project. That publication was supervised by Dr. Carol P. Kowle. The second, Review and Synthesis of Reading in Vocational

Education, was published by the Division of Occupational and Vocational Studies in conjunction with the Division of Education Administration Policy Studies and The Pennsylvania Department of Education. Both titles are available directly from their respective publishers.

Appreciation is expressed to Mrs. Laura Frye for her careful attention to the typing and proofreading of not only the final drafts of each title in the series, but all the preliminary work and intervening drafts required. The secretarial assistance of Rosann Moore, Peggy Kresovich and Sharon Brode in the typing of manuscripts is especially appreciated.

DISCLAIMER

The activity which is the subject of this report was supported in whole or in part by the U. S. Office of Education, Department of Health, Education, and Welfare. However, the opinions expressed herein do not necessarily reflect the position or policy of the U. S. Office of Education, and no official endorsement by the U. S. Office of Education should be inferred.

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SECTION 1
READABILITY

In order to plan for intervening in situations of reading deficiency, several pieces of information are required. First, it must be known how urgent the need to read actually is, in the context of both curriculum and occupational requirements. This does not suggest that reading, in the general literacy sense, may not be important. Educators clearly recognize that reading ability is crucial if learning is to occur. What this first question addresses is an examination of objectives and their component tasks to ascertain how much reading is required to complete the tasks and, ultimately, the objectives of the course.

Although there has been no research to date to distinguish between curricular and occupational reading requirements (Reference Note[1]) it is not difficult to visualize differences between textbook reading and, for example, manufactuers maintenance manuals. When Willis Wagner in his carpentry text (1973) directed students to "follow directions listed in manufacturers manual" (regarding tools), it was intended that the student of carpentry read this literature. That directive identified two kinds of reading: that which is required to read the Wagner textbook (curricular) and that required to read the manufacturer's instructions (occupational). Previous research A. De. W. Smith, 1974; Thornton, 1977; Thornton, 1979; Thornton, 1980) suggests that there could be significant differences in the readability level of sections of textbooks dealing with specific tasks and the readability level of literature pertaining to the performance of those tasks.

It is a fact that reading literature peculiar to an occupational specialty at least implies that some form of reading is a vocational skill. Thus, the second bit of information must be collected. It must be known (or decided) if the teacher, the school, and the school district intend to address reading within the vocational curriculum or as prerequisite skill. If reading is to be dealt with in the vocational curriculum, then all students must receive some form of vocational reading instruction. If, however, reading skill is envisioned to be prerequisite then the thrust of reading in vocational settings would be toward dealing with deficiences. The strategies, in the latter situation, would be individualized and delivered on a case by case basis.

The previous two pieces of procedural information are fairly general; the third and fourth are specific. The third deals with how difficult literature in a specific occupational curriculum is to read. What is the readability level? The fourth deals with how able students are in terms of reading ability. Can students read literature necessary to succeed in a vocational program? We shall deal with these issues separately.

Readability Procedures

Readability procedures are devices to estimate the grade reading level (GRL) of selected pieces of literature. In other words, a readability analysis determines the approximate GRL a person must possess in order to read the literature analyzed. Not the underlining of estimate and approximate. It must be cautioned

that, although these procedures have been validated by extensive research, they are not the sole determinants of readability. Muncrief (1975) discussed a variety of other considerations that are involved in readability assessments. For our purposes of matching literature assessment to student ability an index of readability is a useful measure.

There is a second caution needed about readability procedures. Preliminary results of current research (Reference Note[2]) brings up serious questions about trying to find an average readability level of occupational literature. For example, what does it mean that the average (the word "mean" is normally substituted for the word "average") readability level of a textbook is ninth (9th) grade? Because the word average or mean is used, it can be assumed that some of the literature is higher than ninth and some of it lower. What the average does not tell us is the range of readability levels and the concentration (mode at any level) of readability level.

In order to make sense out of that argument, a little must be known of how readability assessments are done. When analyzing a textbook (or any other lengthy piece of literature) random samples are selected. These samples are analyzed and an average of all of their readability levels is calculated. That average is the mean readability level of the literature. We will get more explicit about how this is done in the next section.

To point out the problem with using the mean (average) some hypothetical samples have been graphed below. The graphs show the

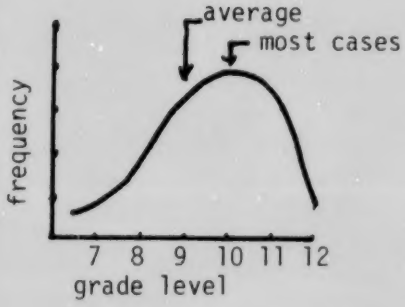
curve which would result if the frequencies of grade level of samples were plotted on the graph. The vertical axis of the graphs represents the frequency that samples were found to be at a particular grade level. The horizontal axis represents the specific grade levels. (See Figure 1)

All of the preceding graphs are of books at the ninth grade readability level. But they all differ in the concentration (mode) of levels. The point here is simply that the mean or average can be a deceptive statistic. The analysis can still be useful, providing the results include the range and distribution of readability scores sampled.

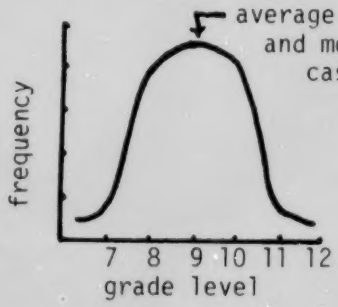
Two readability procedures will be discussed: (1) Fry procedure (See Figure 2); and (2) Flesh procedure (See Figure 3).

A form for calculating has been included to simplify the Flesh Formula calculations. (See Figure 4)

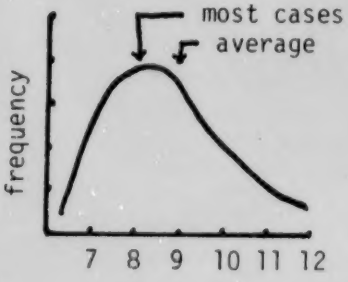
Figure 1: Sample Readability Graph



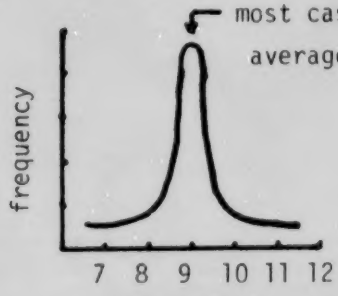
(most cases above 9th)



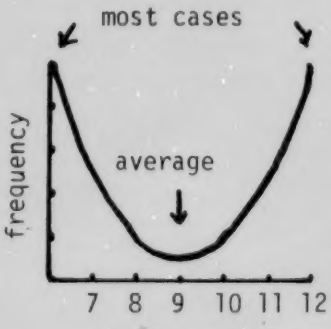
(most cases at 9th
substantial variability)



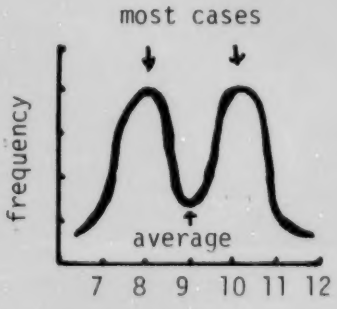
(most cases below 9th)



(most cases at 9th
slight variability)



(most cases at highest
and lowest levels)



(most cases one grade
higher and lower than
average)

Figure 2: GRAPH FOR ESTIMATING READABILITY
by Edward Fry, Rutgers University Reading Center, New Jersey
Average number of syllables per 100 words

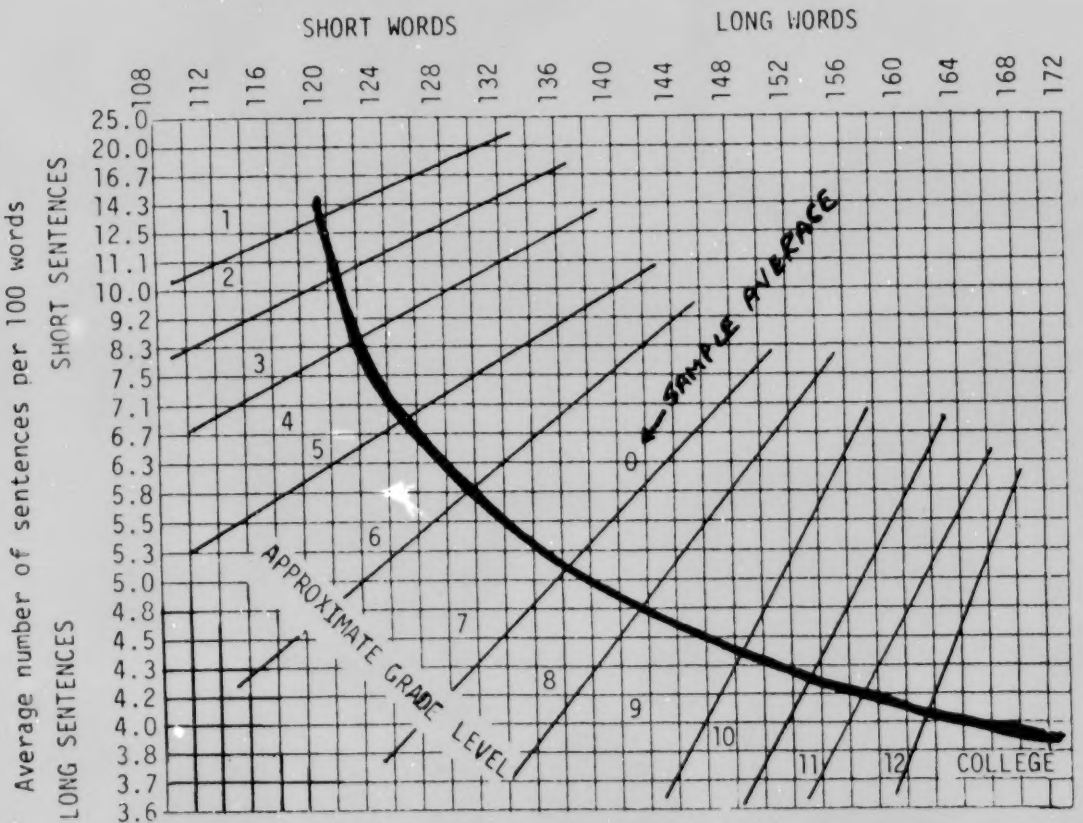


Figure 2 (Continued)

Directions: Use a stratified random procedure, at least five percent for books, more for shorter materials. For example: If a book is 350 pages long, five percent equals 17.5. 350 ÷ 17.5 equals 20. Select a starting number, for example: 6. The first sample page is 6; then 26; then 46; then 66; etc. If one of the pages has no text proceed one page at a time forward until a page is found from which a sample can be taken.

From each of these pages select 100 word passages (alternate positions on page from which taken. For example: beginning, middle, ending). Plot the average number of syllables and average number of sentences per 100 words on the above graph.

This will give you the average readability of the book.

Example:

	Syllables	Sentences
First 100 Words	124	6.6
Second 100 Words	141	5.5
Third 100 Words	158	6.3
Average	141	6.3

Then plot the syllables and sentences for each sample. This will illustrate the range of readability for the literature being analyzed.

(For further information and validity data, see April, 1968 Journal of Reading and March, 1969 Reading Teacher.)

Figure 3: FLESH READABILITY FORMULA PROCEDURE

There is one readability procedure that is easily used with the assistance of a simple calculator. The Rudolph Flesh (1949) Readability Formula involves a count of the syllables in the sample and words per sentence in conjunction with a mathematical formula. The result is a "Reading Ease Score" which translates into grade reading level.

I. 1. Count the words in the sample (100 words or more, if available).
2. Count the number of sentences.
3. Divide the total number of words by the total number of sentences.
4. Multiply that total (average number of words in a sentence) by 1.015.

II. 1. Count the syllables in the sample.
2. Multiply the number of syllables by 100.
3. Divide that total by the number of words in the sample.
4. Multiply that total by .846.

III. Add I and II.

IV. Subtract III from 206.835.
That is the reading ease score. It translates accordingly:

R.E.Score	Grade	R.E.Score	Grade
115-120	1	80- 89	6
110-114	2	70- 79	7
105-109	3	60- 69	8.5
100-104	4	50- 59	11
90- 99	5	30- 49	14.5
		0- 29	College Grad.

Flesh, Rudolph. The Art of Readable Writing. New York: Harper and Brothers, 1949.

Figure 4: Flesh Readability Procedure Form

Textbook_____ Publisher_____

Pg.#	#Wds. ÷ #Sent	X	x 1.015	#Syl x 100 ÷ #Wds.	x .846	Y	

Figure 4 (Continued)

	Minus (x + y)	R.E. Score
206.835		
206.835		
206.835		
206.835		
206.835		
206.835		
206.835		
206.835		
206.835		
206.835		
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206.835		
206.835		

R.E. Score	Grade
115-120	1
110-114	2
105-109	3
100-104	4
90-99	5
80-89	6
70-79	7
60-69	8.5
50-59	11
30-49	14.5
0-29	College Grad.

The textbook sample in Figure 5 demonstrates the rules

Instructions for Calculations

WORD COUNT - Fry: Count all words up to 100 words (may end in partial sentence.) Flesh: Count all words up to approximately 100 (end on full sentence).

Numbers - such as 30, 1951, 27-A, L78G are each counted as one word.

Hyphenated words - one word.

Abbreviations - one word.

Acronyms - such as PVA, NSU, USA, AVA are each counted as one word.

SENTENCES - Fry: Count the sentences and determine the tenth of a sentence when ending in a partial sentence. Flesh: Count all sentences.

Parenthetical expression - (enclosed in brackets) is one sentence even if contained in another sentence.

Semi-colon or colon - If there is a semi-colon or colon in what we usually consider a sentence, that is considered to be another sentence. The easiest way to handle that is to count one sentence overall and add one sentence - count for each colon or semi-colon in the sentence.

RECORDING - Fry: Write down the number of sentences per 100 words. In the example the 100th word is "can." There are 6 full sentences, plus the partial sentence ending in "can." There are 15 words up to and including "can" and 20 words in the sentence. Divide 15 by 20 (15 ÷ 20). That result is approximately .75 and

FIGURE 5: SAMPLE WITH WORD COUNT OVER WORDS

```
 1   2   3    4
USING A DADO HEAD

      5    6    7   8   9  10  11  12  13       14
     THE DADO HEAD CAN BE USED TO CUT DADOS, GROOVES,

15    16       17       18      19          20      21
LAP JOINTS, RABBETS, AND INTERLOCKING JOINTS.  THE

  22   23 24  25   26    27        28   29   30  31
STOCK CAN BE HELD AND CONTROLLED WITH THE FENCE OR

 32    33      34      35       36 37      38
MITER GAUGE, USED SEPARATELY OR IN COMBINATION.

      39  40 41  42     43    44  45   46  47  48
     TO CUT A GROOVE, RAISE THE DADO HEAD TO THE

   49      50    51   52    53   54     55   56
CORRECT HEIGHT AND ADJUST THE FENCE.  FEED THE

  57     58    59    60   61   62  63  64    65
STOCK THROUGH THE MACHINE AS SHOWN IN FIG. 12-33.

  66   67  68    69   70   71     72  73   74
SINCE YOU ARE REMOVING A LARGE AMOUNT OF WASTE,

 75   76  77    78    79   80    81 82    83    84
FEED THE WORK SLOWER THAN WHEN USING A REGULAR SAW

  85    86  87   88    89   90    91     92  93
BLADE.  IF THE GROOVE DOES NOT CONTINUE ALL THE

 94   95   96   97  98  99  100 101  102 103 104
WAY ALONG THE PIECE, A STOP CAN BE PRESET ON THE

 105
FENCE.
```

(WAGNER, W., 1978, P. 177)

rounds to 0.8. Therefore, for the Fry sentence count there are 6.8 sentences per 100 words. Flesh: Count to the end of the sentence in shich the 100th word occurs. Therefore, there are 105 words and seven sentences. Enter these figures on the form and complete the math involved.

SYLLABLES - Syllables are counted in the same way for each procedure. An easy way is to count only those syllables over 1 for each word. For example:

The da/do[1] head can be used to cut da/dos[2], grooves, lap joints, rab/bets[3], and in/ter[4]/lock[5]/ing[6] joints.

Complete the counting for the entire passage in the same manner. Your total then is added to the total number of words (100 for Fry; 105 for Flesh, in this example). That gives you the total syllable count.

RECORDING - Fry: Write down the total number of syllables. On the graph plot the total syllables (across) to the number of sentences per 100 words. That will give you the approximate readability level of that passage. Flesh: Write down the number of syllables in the space on the form and complete the mark as noted. Then add x and y and subtract that figure from 206.835. That is the Reading Ease score and translates to grade level on the chart.

The total sample syllable count and results for Flesh and Fry methods follow in Figure 6.

FIGURE 6: SAMPLE TEXT
WITH SYLLABLES MARKED

THE DA/DO HEAD CAN BE USED TO CUT DA/DOS, GROOVES, LAP JOINTS, RAB/BETS, AND IN/TER/LOCK/ING JOINTS. THE STOCK CAN BE HELD AND CON/TROLLED WITH THE FENCE OR MI/TER GAUGE, USED SE/PAR/ATE/LY OR IN COM/BI/NA/TION.

TO CUT A GROOVE, RAISE THE DA/DO HEAD TO THE COR/RECT HEIGHT AND AD/JUST THE FENCE. FEED THE STOCK THROUGH THE MA/CHINE AS SHOWN IN FIG. 1/2-3/3. SINCE YOU ARE RE/MOV/ING A LARGE A/MOUNT OF WASTE, FEED THE WORK SLOW/ER THAN WHEN US/ING A REG/U/LAR SAW BLADE. IF THE GROOVE DOES NOT CON/TIN/UE ALL THE WAY A/LONG THE PIECE, A STOP CAN BE PRE/SET ON THE FENCE.

Note that for numbers and acronyms, each letter (number) counts as a syllable.

(WAGNER, W., 1978, P. 177)

The following results were obtained from readability analyses of the preceding sample.

Fry:

100 words

6.8 sentences

131 syllables

6th grade

Flesh:

105 words

7 sentences

137 syllables

R.E. Score 86.06

6th grade

Exercise 1

Following are three examples selected from other sections of the same textbook. Practice the procedure, marking syllables and sentence count directly on the samples.

Exercise 1 Sample 1

Single-End Tenoners

The standard design of a single-end tenoner consists of two tenoning heads, two coping heads, a cut-off saw and a movable carriage, Fig. 14-40.

In operation, the stock is clamped or held to the carriage and moved forward through the tenoning heads which make the cheek and shoulder cuts. It then passes by the coping heads which are mounted on vertical arbors and form contours on the shoulders if it is necessary for them to fit over molded edges. Finally the stock moves by the cut-off saw where the tenon is cut to length.

The cutting heads are powered by individual motors and can be adjusted to various vertical and horizontal positions. (Wagner, W., 1978, pp. 228-229)

Exercise 1 Sample 2

Using the Router

The router motor revolves in a clockwise direction (when viewed from above) and therefore should be fed from left to right when making a cut along an edge facing you. When cutting around the outside of oblong or circular pieces, always move the machine in a counter-clockwise direction.

The rate of feed will vary with the hardness of the wood and size of cut. Routers have an induction motor which will slow down somewhat under load. Excessive loss of speed indicates too heavy a cut. When the work is heavy, it is best to reduce the depth of the cut and maintain a good rate of feed. (Wagner, W., 1978, p. 254)

Exercise 1 Sample 3

Using Disk Sander

The disk sander is used mainly for edge sanding. Hold the work firmly on the table and move it lightly against the disk. Use only the half of the disk that revolves downward past the table. Move the work along this surface and do not hold it at one place or excessive heat will be generated, causing the abrasive to load with gum and pitch. This will shorten the life of the abrasive and also cause burn marks on your work.

Pieces of irregular shapes are usually guided freehand. For accurate work on straight edges, use a miter gauge in the table slot as shown in Fig. 17-4. Other types of guides and auxiliary tables can be used for special work. (Wagner, W., 1978, p. 270)

SAMPLES: HOW SELECTED AND HOW MANY

It is important, if an accurate picture of the literature is to be obtained, that the samples to be analyzed be selected at random. Too many subjective errors would be introduced by merely paging through the book, picking what appears to be representative samples. The easiest way and one that is sufficiently random is entitled a stratified random sampling.

In order to achieve the stratified random sample, it must first be decided how many samples are to be drawn. A useful rule is to select samples from 5% of the pages in the book. Remember, however, that the more samples drawn, the more accurate will be the analysis. That point is demonstrated in the following analyses (See Figure 7) of a textbook under consideration in which 3, 6, 10, 15 were drawn. (Average was used in this case to distinguish between results of analyses in which increasing numbers of samples were drawn.)

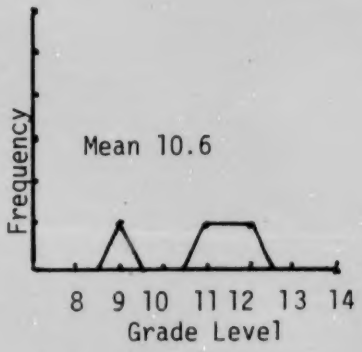
It is recommended that 5% sample or more be drawn for accuracy.

Procedure: Assume a book has 300 pages (not including glossary or index). A 5% sample requires (.05 x 300) 15 samples. To establish the starting page divide the total pages (300) by the total samples required (15). That result is 20. Randomly pick a number from 1-20. This can be done using numbers in a hat. That number is the starting page. Let's assume it is 6. The remainder

Figure 7: Sample Graphs of GRL
Frequencies: 3, 6, 10, 15 Samples

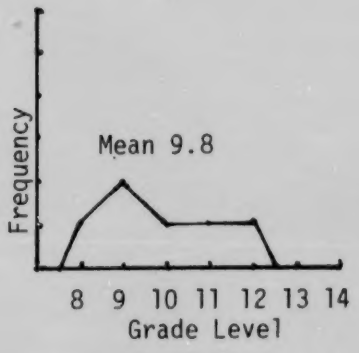
3 Samples

GRL	Freq.
9	1
11	1
12	1



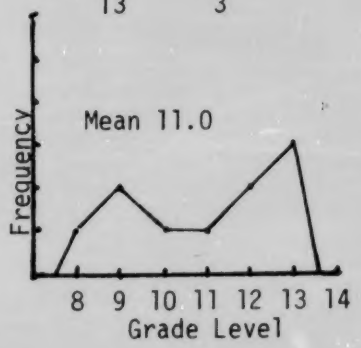
6 Samples

GRL	Freq.
8	1
9	2
10	1
11	1
12	1



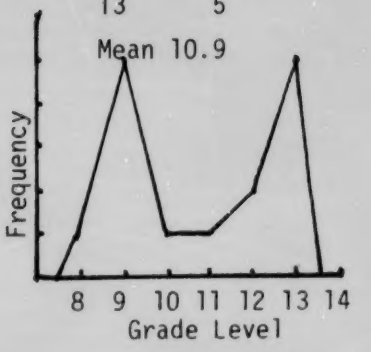
10 Samples

GRL	Freq.
8	1
9	2
10	1
11	1
12	2
13	3



15 Samples

GRL	Freq.
8	1
9	5
10	1
11	1
12	2
13	5



Now we know the pages of the book we will use in the analysis. If any of those pages contains no text (some may be pictures or diagrams) move one page at a time forward or backward until text is found. It is also recommended that the sample 100 words be selected alternatively from the beginning (B) and end (E) of the page. Therefore, page 6 would be 6-B (for beginning), page 26-E (for end), page 46-B, etc.

Exercise 2

Compute a stratified random sample schedule for the following:

1. Textbook with 350 pages.
2. Textbook with 1000 pages.
3. Textbook with 525 pages.

If the literature you plan to analyze contains less than 200 pages, but more than 25, select 10 samples. For literature of less than 25 pages, but more than 5, select every other page. For literature less than 5 pages, take a sample of every page.

On the following page (See Figure 8) is a form to assist you in recording your findings. It is always a good idea to keep a file of literature analyzed.

Figure 8: Readability Record

Author(s):

Title of Literature:

Publisher:

Publication Data:

Total Number of pages:

Percent of pages sampled:

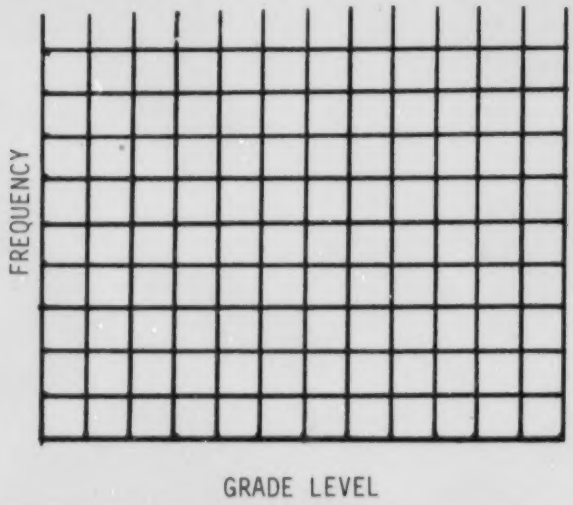
Procedure used:

Page numbers from which samples were taken:

Highest readability:

Lowest readability:

Graph for Plotting Results



SECTION 2
CLOZE PROCEDURE

STUDENT READING ABILITY

Diagnostic reading test scores are often available for students in vocational programs. These scores, normally on file at the home school (in the counselors office at the comprehensive high school), are useful indicators of a student's general reading ability. How well they relate to vocational reading requirements is subject to conjecture. There simply has not been a concerted effort to separate vocational reading skill from general literacy skill. Because of these unknowns it is strongly recommended that you not accept a GRL score as final. Standardized reading test scores are useful indicators, but they should be supplemented with teacher made vocational reading tests.

A useful and highly adaptable reading test is the cloze procedure.

> The cloze procedure is an objective measure of language correspondence between reader and writer. It consists of a cloze (word) unit, a single occurence of a successful attempt to reproduce accurately a part deleted from a message, by deciding from the context that remains what the missing part should be (Taylor, 1953).

> The cloze procedure differs from vocabulary contextual texts. Rather than choosing omitted words because of definition and purpose, the cloze units are chosen mechanically; every fifth word, for example, occurring at any point in a continuous passage is omitted. The cloze design incorporates control against misrepresenting strength/weakness in content vocabulary as an indication of the test subject's ability/inability to read (Thornton, 1979).

Any piece of literature can be clozed. That includes textbooks, occupational literature, safety messages, codes, medical contraindications, literally anything. The procedure is described below:

1. Select a piece of literature.
2. Leave the first sentence intact.
3. Delete every fifth word.
4. Leave the last sentence intact.
5. Instruct the student to read the entire passage first, then begin filling in the blanks.
6. Instruct the student to be aware when guessing is the rationale for word selection, but to guess when other rationale fails.

Scoring the test is accomplished as follows:

0-39.9% Frustrational level (Student will not be able to read the literature)

40.0-69.9% Instructional level (Student will require intervention to be able to read the literature)

70.0-100.0% Independent level (Student is able to read the literature without intervention)

On the following pages five different cloze tests have been prepared using on-the-job literature. The correct words which have been deleted are listed following each example.

FIGURE 9: BIFOLD INSTALLATION INSTRUCTIONS
CLOZE TEST

INSTALLING:

1. VERIFY THE FINISHED OPENING SIZE BY MEASURING AS ILLUSTRATED. THE OPENING _____ SHOULD CORRESPOND WITH 1/8" _____ THE NOMINAL SIZE DESCRIPTION _____ YOUR BIFOLD UNIT. THE _____ AND HARDWARE ARE SIZED _____ FIT THE OPENING PROVIDING _____ TOLERANCE FOR SMOOTH OPERATION. _____ FINISHED OPENING HEIGHTS MUST _____ 80-1/2" FOR 6'8" UNITS, _____ FOR 6'6" UNITS AND _____ FOR 8' UNITS.
2. _____ THE OVERHEAD TRACK 1-3/8" _____ THE FRONT OF THE _____ JAMB WITH SCREWS PROVIDED. _____ THE MOULDING (FASCIA STRIP) _____ FRONT OF IT. 1-1/2" _____ NAILS ARE RECOMMENDED. ON _____ UNITS MAKE CERTAIN TRACK _____ TURNED SO THAT THE _____ PIVOT BUSHING IS TO _____ RIGHT FOR RIGHT-HAND OPERATION _____ FROM THE LIVING AREA.)

FIGURE 9 (CONTINUED)

_____ INSTALL THE JAMB BRACKET _____ #256) USING THE PLACEMENT _____ PRINTED ON REVERSE SIDE _____ THIS SHEET TO MARK _____ DRILL SCREW HOLES.

4. _____ INSTALLING DOORS CHECK BOTTOM _____ FOR APPROXIMATE SETTING. THREE _____ THREADS SHOULD BE EXPOSED _____ THE PLASTIC AND THE _____ HEX SHOULDER.

5. INSTALL _____ DOORS THAT ARE HINGED _____ BY INSERTING THE TOP _____ INTO THE PLASTIC TRACK _____ AND THE GUIDE _____ INTO THE TRACK. LIFT _____ TO COMPRESS THE SPRINGS. NOW THE BOTTOM PIVOT MAY BE BROUGHT OVER THE JAMB BRACKET AND LOWERED INTO PLACE.

BIFOLD INSTALLATION INSTRUCTION, AMARILLO, TEXAS: MAYWOOD, INC. (NO DATE)

FIGURE 9 (CONTINUED)

SIZE	NAIL	OR
TO	IN	BEFORE
OF	FINISHING	PIVOTS
DOORS	2-DOOR	FULL
TO	IS	BETWEEN
PROPER	PLASTIC	METAL
THE	THE	TWO
BE	(VIEWED	TOGETHER
78-1/2"	3.	PIVOT
96"	(PART	BUSHING
INSTALL	GUIDE	WHEEL
FROM	OF	UP
HEAD		

FIGURE 10: PNEUMATIC NAILER SAFETY
CLOZE TEST

WARNING:

OPERATORS MUST WEAR SAFETY GLASSES OR GOGGLES WHEN OPERATING THE TOOL.

WHEN THE AIR SUPPLY _____ CONNECTED KEEP YOUR HANDS _____ BODY AWAY FROM THE _____ DISCHARGE AREA. DO NOT _____ THE TOOL WITHOUT NAILING _____ MATERIAL.

OPERATING PRESSURE MUST _____ EXCEED 100 PSIG, (6.8 _____.

DO NOT CONNECT FEMALE _____ COUPLER DIRECT TO TOOL. _____ MALE FREE FLOW NIPPLE _____ TOOL, AND FEMALE QUICK _____ TO AIR HOSE. IF _____ IMPROPERLY AND DISCONNECTED FROM _____ SUPPLY TOOL WILL REMAIN _____ WITH AIR, WILL NOT _____ EXHAUST AND WILL FIRE _____ NAIL IF TRIGGER MECHANISM _____ ACTUATED.

ALWAYS DISCONNECT THE _____ SUPPLY BEFORE

FIGURE 10 (CONTINUED)

MAKING ADJUSTMENTS _____ SERVICING THE TOOL.

CHECK _____ TO BE CERTAIN THE _____ TRIP MECHANISM IS WORKING _____.

PUSHER SPRING (CONSTANT FORCE _____), CAUTION MUST BE USED _____ WORKING WITH THE SPRING _____ OUTSIDE THE TOOL. THE _____ IS WRAPPED AROUND, BUT _____ ATTACHED TO, A ROLLER. _____ THE SPRING IS EXTENDED _____ ITS LENGTH, THE END _____ COME OFF THE ROLLER _____ THE SPRING WILL ROLL _____ WITH A SNAP, WITH _____ CHANCE OF PINCHING YOUR _____. ALSO THE EDGES OF _____ EXTENDED SPRING ARE VERY _____ AND COULD CUT.

DO _____ USE OXYGEN OR COMBUSTIBLE _____ AS A POWER SOURCE _____ THIS TOOL.

FAILURE TO OBSERVE ANY OF THESE WARNINGS MAY RESULT IN INJURY.

MODEL N8 SERIES PNEUMATIC NAILER. EAST GREENWICH, RHODE ISLAND: BOSTITCH DIVISION OF TEXTRON, 1978.

FIGURE 10 (CONTINUED)

IS	CHARGED	NOT
AND	FREELY	IF
FASTENER	A	BEYOND
FIRE	IS	WILL
INTO	AIR	AND
NOT	OR	UP
ATMOSPHERES)	REGULARLY	THE
QUICK	CONTACT	HAND
ATTACH	PROPERLY	THE
TO	SPRING	THIN
COUPLER	WHEN	NOT
CONNECTED	ASSEMBLY	GASES
AIR	SPRING	FOR

FIGURE 11: REVERSING HAMMER DRILL CLOZE TEST

SWITCH

THE VARIABLE SPEED TRIGGER SWITCH PERMITS A WIDE RANGE OF SPEED CONTROL - THE FARTHER THE TRIGGER IS DEPRESSED, THE HIGHER THE SPEED OF THE DRILL. A SWITCH LOCKING BUTTON _____ LOCKING THE TRIGGER IN _____ FULL "ON" POSITION FOR _____ OPERATION. TO LOCK THE _____ "ON" DEPRESS TRIGGER FULLY _____ PUSH UP LOCKING BUTTON _____, THEN GENTLY RELEASE TRIGGER. _____ RELEASE LOCKING MECHANISM, DEPRESS _____ FULLY, THEN RELEASE IT. _____ NOT LOCK TRIGGER "ON" _____ HAND-HELD DRILLING, SO THAT _____ CAN RELEASE TRIGGER INSTANTLY _____ BIT BINDS IN HOLE. _____ SURE TO RELEASE THE _____ LOCKING BUTTON BEFORE DISCONNECTING _____ PLUG FROM THE POWER _____. FAILURE TO DO SO _____ CAUSE THE TOOL TO _____ IMMEDIATELY THE NEXT TIME _____ IS PLUGGED IN. DAMAGE _____ INJURY COULD RESULT.

FIGURE 11 (CONTINUED)

NOTE: _____ LOWER SPEEDS FOR STARTING _____ WITHOUT A CENTER PUNCH. _____ IN METAL OR PLASTICS, _____ CERAMICS, OR MIXING PAINT. _____ SPEEDS ARE BETTER FOR _____ WOODS AND COMPOSITION BOARDS, _____ FOR USING ABRASIVE AND _____ ACCESSORIES.

REVERSING SWITCH: FOR _____ SCREWS OR EASING DRILL _____ OUT OF TIGHT HOLES, _____ THE REVERSING SWITCH, TOWARD _____ TO REVERSE THE DRILL _____. THE TRIGGER SWITCH SHOULD _____ RELEASED TO THE "OFF" _____ BEFORE MOVING THE REVERSING _____. AFTER ANY REVERSING OPERATIONS, RETURN SWITCH TO THE FORWARD, "F" POSITION.

(OWNERS MANUAL: 3/8" VARIABLE SPEED REVERSING HAMMER DRILL. TOWSON, MARYLAND: THE BLACK & DECKER MFG. CO., 1979)

FIGURE 11 (CONTINUED)

PERMITS	BE	HIGHER
THE	SWITCH	DRILLING
CONTINUOUS	THE	AND
TRIGGER	SUPPLY	POLISHING
AND	WILL	REMOVING
"A"	START	BITS
TO	IT	SLIDE
TRIGGER	OR	"R"
DO	USE	MOTOR
FOR	HOLES	BE
YOU	DRILLING	POSITION
IF	DRILLING	SWITCH

FIGURE 12: WINDOW INSTRUCTIONS CLOZE TEST

CODES:

SELECTION OF ANDERSEN PRODUCTS WHICH CONFORM TO ALL APPLICABLE LAWS, ORDINANCES, BUILDING CODES AND SAFETY REQUIREMENTS IS THE SOLE RESPONSIBILITY OF THE ARCHITECT, BUILDING OWNER AND/OR CONTRACTOR AND ANDERSEN CORPORATION HAS NO RESPONSIBILITY IN THIS REGARD. CHECK WITH YOUR _____ ANDERSEN DEALER AND BUILDING _____ OFFICIALS FOR SPECIFIC INFORMATION.

_____ GLASS:

UNLESS SPECIFICALLY ORDERED, _____ WINDOWS ARE NOT PROVIDED _____ SAFETY GLASS, AND IF _____, THE GLASS COULD FRAGMENT _____ INJURY. MANY LAWS AND _____ CODES REQUIRE SAFETY GLASS _____ LOCATIONS ADJACENT TO _____ NEAR DOORS. ANDERSEN WINDOWS _____ AVAILABLE IN SAFETY GLASS _____ MAY REDUCE THE LIKELIHOOD _____ INJURY WHEN BROKEN. INFORMATION _____ SAFETY GLASS IS AVAILABLE _____ YOUR LOCAL ANDERSEN SUPPLIER.

FIGURE 12 (CONTINUED)

_____

PERMA-SHIELD:

PERMA-SHIELD PRODUCTS IN _____ COLOR MAY BE PAINTED _____ A QUALITY OIL BASE _____ LATEX PAINT. CREOSOTE BASE _____ SHOULD NOT COME IN _____ WITH PERMA-SHIELD. DO NOT _____ WEATHERSTRIPPING. ABRASIVE CLEANERS OR _____ CONTAINING CORROSIVE SOLVENTS SHOULD _____ BE USED ON PERMA-SHIELD _____.

PAINTING OR STAINING MAY _____ DAMAGE TO WHITE VINYL. _____ ADDITIONAL INFORMATION, WRITE TO _____ CORPORATION.

PREFINISHED:

ANDERSEN _____ WOOD GLIDING DOOR IN _____ COLOR AND PREFINISHED BASEMENT _____ IN WHITE MAY BE _____ WITH A QUALITY OIL _____ PAINT.

FOR ADDITIONAL INFORMATION _____ PAINTING, WRITE TO ANDERSEN _____.

FIGURE 12 (CONTINUED)

PRIMED WOOD:

FACTORY PRIMED _____ PRODUCTS SHOULD BE FINISH _____ AS SOON AS POSSIBLE. _____ SIX MONTHS UNITS SHOULD _____ PRIMED AGAIN BEFORE FINISH _____ ARE APPLIED.

BEFORE INSTALLING, _____ THE EDGES OF GLAZING _____, LAPPING PAINT SLIGHTLY ONTO _____ GLASS, TO PROVIDE ADDITIONAL _____. PRIME OR PROTECT INSIDE SURFACES OF SASH AS SOON AS POSSIBLE.

(DETAIL CATALOGUE NO. 802, ANDERSEN WINDOWS - GLIDING DOORS. BAYPORT, MINNESOTA: ANDERSEN CORPORATION, 1980, P. 44)

FIGURE 12 (CONTINUED)

LOCAL	PAINTING	UNIT
CODE	TERRATONE	PAINTED
SAFETY	WITH	BASE
ANDERSEN	OR	ON
WITH	STAINS	CORPORATION
BROKEN	CONTACT	ANDERSEN
CAUSING	PAINT	PAINTED
BUILDING	SOLUTIONS	AFTER
IN	NOT	BE
OR	PRODUCTS	COATS
ARE	CAUSE	PRIME
WHICH	FOR	COMPOUND
OF	ANDERSEN	EXTERIOR
ON	PREFINISHED	PROTECTION
FROM	TERRATONE	

FIGURE 13: LS PINNER SERVICE CLOZE TEST

AIR PRESSURE

THE RECOMMENDED OPERATING PRESSURE RANGE FOR THE POWER SOURCE OF THE LS PIN TACKERS IS 70 TO 100 P.S.I.G. OF CLEAN, DRY, COMPRESSED AIR.

AIR _____ REQUIREMENTS VARY WITH THE _____ IN WHICH THE LS _____ TACKERS ARE UTILIZED. FAILURE _____ REGULATE THE AIR PRESSURE CAN _____ IN THE FASTENER BEING _____ DRIVEN. USE ONLY THE _____ PRESSURE REQUIRED TO PERFORM _____ APPLICATION AND NO MORE. _____ AIR PRESSURE CAN RESULT _____ EARLY FAILURE OF THE _____ PARTS IN THE LS _____ TACKERS.

DANGER OF OXYGEN

_____ WILL REACT WITH THE _____ AND OIL USED IN _____ SENCO TOOL. THIS CAN _____ IN AN EXPLOSIVE CONDITION _____ IS EXTREMELY HAZARDOUS.

FIGURE 13 (CONTINUED)

DANGER _____ OTHER BOTTLED GASES

IT _____ POSSIBLE FOR A HAZARDOUS _____ TO EXIST WHEN USING _____ GASES AS A POWER _____. THE HAZARDOUS CONDITION IS _____ PRESSURE WHICH CAN EXCEED _____ LIMITS PRESCRIBED FOR THE _____. THEREFORE, ONLY CLEAN, DRY, _____, COMPRESSED AIR MUST BE _____ AS A POWER SOURCE.

_____

THE LS PIN TACKERS _____ BE KEPT WELL LUBRICATED _____ CONSISTENT PERFORMANCE. THEY SHOULD _____ OILED DAILY BY EITHER _____ TWO DROPS OF OIL _____ THE AIR INLET AT _____ BACK OF THE TOOL _____ USING AN OILER ON _____ AIR LINE. DETERGENT OIL _____ NOT BE USED OR _____ TO THE RUBBER COMPONENTS _____ THE TOOL WILL RESULT.

FIGURE 13 (CONTINUED)

USE ONLY 10-WEIGHT NON-DETERGENT OIL IN THE PIN TACKERS.

SENCO FASTENING SYSTEMS SERVICE MANUAL, 1979, P. 4.

FIGURE 13 (CONTINUED)

PRESSURE	GREASE	USED
APPLICATION	A	LUBRICATION
PIN	RESULT	SHOULD
TO	WHICH	FOR
RESULT	OF	BE
IMPROPERLY	IS	PLACING
AIR	CONDITION	IN
THE	BOTTLED	THE
EXCESSIVE	SOURCE	OR
IN	EXCESSIVE	THE
COMPONENT	THE	MUST
PIN	TOOL	DAMAGE
OXYGEN	REGULATED	IN

Exercise 3

Cloze the following passage and write out the instructions to the students regarding how they should proceed.

General Information - Lap and Panel Sidings

Nailing: Use only galvanized nails. Box headed nails with checkered heads are preferred with textured sidings. For best results on prestained and prepainted sidings, use 8d Masonite Brand Color Matched Nails available from local dealers.

Cutting: Use a fine-toothed hand saw or a power saw with a combination blade. Insure that the cutting action is toward, or into, the finished side.

Vapor Barriers: A properly installed continuous vapor barrier (1 perm or less rating) such as polyethylene film or foil backed gypsum board, is required on the warm (interior) side of the exterior walls in all buildings. This will preclude damaging condensation from occuring within the walls.

Foam Sheathing: Masonite brand siding products may be applied over foam plastic sheathing. The following special application and construction techniques are recommended:

1. Adequate bracing of the wall is required.
2. Nail lengths must be increased to compensate for the greater thickness of this sheathing. 3/4" Foam - Lap Siding 10d nail, Panel siding 8d nail, 1" Foam - Lap

Siding 12d nail, Panel Siding 10d nail. Care must be used to avoid crushing of the sheathing during nailing.

3. It is very important to use a continuous unbroken vapor barrier on the interior face of the walls, such a 6 mil polyethylene film, to reduce the possibility of moisture accumulation inside the wall cavities. In some cases it may be necessary to vent these cavities to the outside when foam plastic sheathing is used.

Masonite Corporation will assume no responsibility for problems related to moisture accumulation within the walls or to crushing of the foam plastic sheathing during or after application of the siding. (X-90 Siding Application, 1980, p. 16)

Exercise 3: Answer Sheet

Instructions:

Words List:

The cloze procedure can also be used as a teaching technique. A variety of cloze modifications are useful for vocational teachers.

The changes in the procedure reflect the purpose of the exercise. If, for example, an occupational instructor wishes to highlight safe practices in a shop and be certain that the student reading safety literature understands what is being read, the passage can be "clozed," deleting those words which are critical to the safe practices comprehension. The following spray painting passage with "instructional modification" words (to be deleted) underlined illustrates the technique:

SAMPLE: INSTRUCTIONAL MODIFICATION CLOZE

Electrostatic spraying with a hand-held gun requires extra care. The gun, the piece to be sprayed, and all conductive equipment must be grounded to prevent sparking. While you are spraying, the gun must be held twice the sparking distance or at least 12 inches from the work and other conductive surfaces.

All electrical equipment must be in another room or well away from the spraying area (at least 20 feet) or it must be of the type approved for hazardous locations and explosive areas. (HEW Publication, NIOSH 76-178, p. 8)

Another modified cloze teaching technique is the "lexical cloze." Lexical is defined as relating to words of a language. The lexical cloze involved deletion of words according to the kinds of words they are, such as nouns, verbs, adjectives, etc. A later segment of this article develops case grammar modifications utilizing the lexical cloze, establishing applicability for occupational education reading intervention. The example which follows illustrates use of verb deletions in a carpentry application. The words to be deleted have been underlined:

GUMMING

Repeated filing is bound to make the teeth shallow and grinding them deeper with a grinding wheel is known as gumming. A saw does not need to be gummed every time it is rounded and set and filed.

When gumming by hand, to insure that you will gum all the teeth the same depth so the saw will be in balance, it is an easy matter to make a simple wooden compass with a round piece of wood to fit the center-hole of the saw. Drill a hole to hold a blue pencil

and describe a circle the proper distance below the teeth. Then gum until the bottom of all the gullets just touch the edge of the circle.

When gumming with a grinding wheel, the operation should be performed by going around the saw several times. Do not crowd the wheel and take too deep a cut. Doing too much work at one time will heat the gullets and stretch the rim so that the saw will need hammering to restore the original tension. Crowding the wheel as as to blue and burn the gullets is sure to injure the saw, often glazing it so hard that a file will make no impression on it. From these hard spots small cracks begin, invisible at first to the eye, but gradually enlarging until they become dangerous fractures. (Gumming. Care and Use of Circular Saws. Fitchburg, MA: Simonds Cutting Tools, Wallace Murray Corporation, 1979, p. 14)

Note that only the vergs involving an action on part of the student have been marked for deletion. It is the activity that is emphasized in this reading intervention exercise.

When used as a teaching technique, the cloze procedure is easily adapted to provide for increasing degree of difficulty. Often vocational students have experienced a history of failures in reading. The pattern is conducive to diminished motivation in an attempt to read. In order to break the pattern and increase the likelihood of a motivated reader, a pattern of reading successes is useful. Literature of any level of readability can be clozed. Thus, vocational literature at a low readability level can be used for those students who need a success stimulus. In addition, for teaching purposes, synonymous or words close to the correct word can be accepted. The number of clozed words can be decreased, instead of following a schedule. The next example illustrates this point:

SOLID VINYL SOFFIT AND FASCIA SYSTEMS

1. The Bird soffit system utilizes a Quarter-Round Molding accessory--solid or perforated ventilating panels--and either an "F" Channel or a ½ inch "J" Channel.

2. In every case, the object is to provide two parallel slots--one on the house and the opposite side at the fascia--to allow for the insertion of soffit panels.

3. Either the Quarter-Round Molding or the "F" Channel may be used to provide a channel support at the wall. When the soffit area is open, the "F" Channel can be nailed directly to the wall. The Quarter-Round Molding will require a nailing support.

4. Where the soffit area is closed the Quarter-Round Molding can be nailed to the wooden soffit provided that it is level with the "F" Channel on the bottom of the fascia.

5. The "F" Channel is installed on the outer bottom edge of the fascia board to provide support for the outer edge of the panel.

6. The soffit panel is then cut to length. When you measure between channels, be sure to subtract one quarter inch for expansion.

(Solid Vinyl Soffit . . . , 1978).

For the word "slots," the student would be correct inserting "holes," for example. Note that only six deletions have been made and all are heavily clued.

CASE GRAMMAR AND THE CLOZE PROCEDURE

Gibson and Levin (1979) describe Fillmore's theory of case grammar. ". . . which imaginatively combines syntactic and semantic features." The study of meanings (semantics) and the orderly system of words (syntax) combine in Fillmore's Case Concepts (Brown, 1973). The theory of case grammar is easily adapted to teaching techniques

using the cloze procedure. The following illustrations are from Wagner's Modern Carpentry (1979).

Agentive (A) - "The typically animate, perceived instigator of action."

Some applicators of asphalt shingles perfer to use a woven or closed-cut valley design, especially on re-roofing work (p. 190).

Instrumental (I) - "The inanimate force or object casually involved in the state or action named by the verb."

In modern construction, pneumatic powered staplers are often used to install asphalt shingles (p. 192).

Dative (D) - "The animate being affected by the state or action named by the verb."

Carpenters may be injured by improper lifting or carrying of heavy objects.

Factive (F) - "The object or being resulting from the state or action named by the verb."

Too wide a kerf can result from saw blade chatter.

Locative (L) - "The location or spatial orientation of the state or action named by the verb."

The (radial) arm is attached to a vertical column at the back of the table (p. 38).

Objective (O) - "The semantically most neutral case: anything representable by anoun whose role in the state or action named by the verb depends on the meaning of the verb itself."

Routers are used to cut irregular shapes and to form various contours on edges . . . (p. 35).

Benefactive (B) - "A noun deriving benefit of the action of the verb."

Sharp blades and cutters insure accurate work and make the tool much safer to operate (p. 41).

Comitative (C) - "In accompaniment."

The most vital factor in stair design is the relationship between the rise and (riser) and run (tread minus nosing) (p. 351).

Temporal (T) - "When the verb is accomplished or occurs."

Do not remove any diagonal braces or spacer strips until after their installation is complete (p. 225).

Modified cloze techniques can be used as introductory exercises, included in self-instruction packets, adapted for games, or structured for remedial work. They provide an excellent method of coordinating in-class vocational work and English or remedial reading treatment. (Reference Note 3).

Exercise 4

Underline each word in the following passage which could be clozed by Fillmore rules, entering above the word the letter which indicates the rule used.

EXTERIOR WALL FINISH

The term "exterior finish" includes the application of all exterior materials of a structure. It generally refers to the roofing materials, cornice trim boards, wall coverings, and trim members around doors and windows. The installation of special architectural

woodwork at entrances or the application of a ceiling to a porch or breezeway area would also be included under this broad heading.

Previous units have described the application of the finished roof and the installation of the trim around windows and outside doors. This unit provides information about the construction and finish of cornice work and the materials and methods used to provide a suitable outside wall covering.

CORNICE DESIGNS

The cornice, also called an eave, is formed by roof overhang and provides a finished connection between the wall and the edge of the roof. It is an important element in the total appearance of a structure and the architectural style will determine to a large extent the design requirements. Fig. 12-1 includes a number of detailed cornice sections secured from architectural drawings of contemporary residential structures.

Diagrams of several closed or "boxed" cornice designs are illustrated in Fig. 12-2. An open cornice is sometimes used, exposing the rafters and underside of the roof sheathing. Wide overhangs are used extensively in modern buildings. These provide shade for large window areas, protect the walls, and add to attractiveness of the structure.

The rake is the part of a roof that overhangs a gable. It is usually enclosed with carefully fitted trim members.
(Wagner, W. H., 1979; p. 249)

SECTIONS 3 - 6

READING VOCATIONAL TEXTS

READING VOCATIONAL TEXTS

The following four sections each present a set of important content reading skills. Only those skills particularly relevant to vocational texts have been included. Moreover, each skill has been broken down into segments requiring no more than 5-10 minutes of class time every other day. All homework utilizes the text assignments you would normally require at that point in your course. Because students must pay careful attention to their text in order to complete the reading skill assignment, they should more thoroughly understand the content material than they ordinarily would.

Each section presents the given skill using a variety of vocational examples. Opportunities are then provided for you to apply the skills so that you can be assured of mastering each one.

Following the individual skill discussions is a section called "Textbook Application." It is here that you apply each skill to your own course textbook. This second application accomplishes three purposes: 1) It allows you to locate examples and sample exercises that you can use in your classroom, thereby greatly reducing extra preparation time reading instruction might entail; 2) It enables you to tailor the skills to your text; and 3) It gives you an additional practice opportunity, this time using the same materials your students will use.

At the end of each section are additional suggestions for teaching the new skills.

SECTION 3-6 TIME FRAME

SECTION		TIMING
3	Basic Vocabulary Skills	Weeks 1 and 2
	Formal definitions	
	Synonyms	
	Illustrations	
	Glossaries	
	Textbook application	
	Teaching students basic vocabulary skills	
4	Paragraph Comprehension	Weeks 3, 4 and 5
	Paragraph subject	
	Paragraph main idea	
	Textbook application	
	Teaching students paragraph comprehension	
5	SQ4R	Weeks 6, 7, and 8
	The SQ4R method of study	
	Textbook application	
	Teaching SQ4R	
6	Recognizing and Recording Complex Information	Weeks 9, 10 and 11
	Classification	
	Comparison	
	Cause and effect	
	Textbook application	
	Teaching students to recognize and record complex information	

SECTION 3
BASIC VOCABULARY SKILLS

Section 3

Basic Vocabulary Skills

Central to carpentry is its specialized technical vocabulary. Complete and rapid comprehension of this vocabulary is imperative for the student. This is particularly important because authors of occupational literature assume their readers have a basic understanding of important terms. Since it is essential for students to understand the technical terms in their field, most textbook authors have taken care to provide definitions and other comprehension aids. The simplist of these is the use of italics or boldfaced type to highlight important terms. Four other aids are discussed below: formal definitions, synonyms, illustrations, and glossaries. In addition, suggestions are made for teaching students how to make educated guesses when one of the other comprehension aids is not provided.

Formal Definitions

Often, an author will define an important technical term in the sentence or sentences that introduce it.

> The valley is the internal angle formed by the junction of two sloping sides of a roof. (Anderson and Winslow, 1976, 48)

term	definition
valley	internal angle formed when two sloping sides of a roof meet.

Clue words can warn the reader that a definition is included in the sentence. These include "is," "means," "is referred to," "is called," and "is defined as."

Exercise 5

Locate the technical term and its definition (or formula) in the following examples (remember that a technical term may include one word or several).

Exercises

A bill of materials is a table of information that tells the requirements for a given project (Feirer & Hutchings, 1976, 58).

term _____ definition _____

The combined slab and foundation, sometimes referred to as the thickened-edge slab, is useful in warm climates where frost penetration is not a problem (Anderson & Winslow, 1976, 15).

term _____ definition _____

Since the goal at this stage of construction is to enclose the structure and make the roof watertight, only those partitions that support the ceiling and/or roof (bearing partitions) are usually installed (Wagner, 1979, 142).

term _____ definition _____

The following formula can be used to determine the cubic feet for any square or rectangular area when all dimensions are given in feet:

$$\text{Cu. yds.} = \frac{\text{width x length x thickness}}{27}$$

(Wagner, 1979, 109).

term	definition
_____	_____

Synonyms

As an alternative to a formal definition, an author may clarify a technical term by the use of a synonym. The synonym may be enclosed in commas or parentheses directly following the term or set off by the word "or."

Two types of concrete floor construction are the combined (or unified) slab and foundation and the independent slab and foundation (Feirer & Hutchings, 1978, 274).

term	synonym
combined	unified

Exercise 6

The members used to span over window and door openings are called headers or lintels (Anderson & Winslow, 1976, 34).

term	synonym
_____	_____

An access hole (also called a scuttle hole) must be included in the ceiling frame to provide an entrance to the attic area (Wagner, 1979, 153).

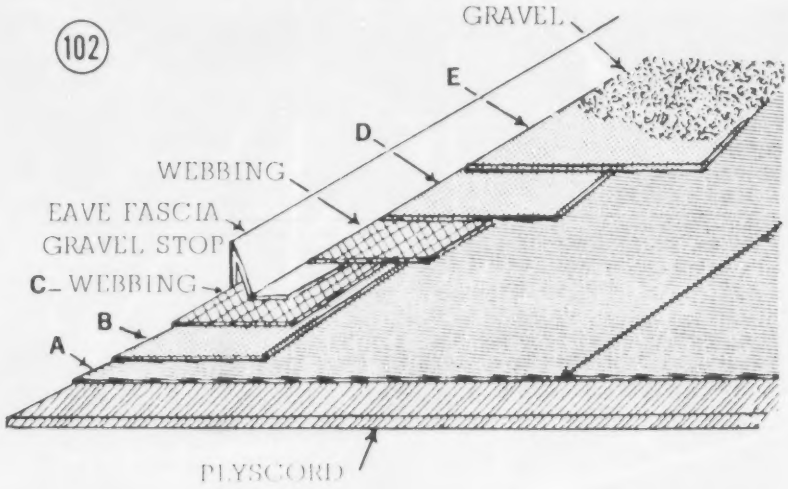
term	synonym
_____	_____

Illustrations

Carpentry literature relies heavily on illustrations to define important terms. Unfortunately, students often skip over the illustrations when they are reading. The first task of an instructor is to impress on students the need to immediately study the designated figure whenever it is mentioned in the prose (Ex: "See Fig. 8-2"). In the following example (Figure 14) those terms explained by an illustration are noted along with the number of the diagram. Forcing students to physically note this information is a useful first step in teaching them to use diagrams as comprehension aids. Later they will apply the visual definition to the prose automatically.

Figure 14: Definition By Illustration

A gravel stop, Illus. 102, 103, should be used when finished roof is to be covered with gravel. In this application, the plyscord sheathing is covered with #15 felt -- A. The starter strip -- B, Illus. 102, is nailed or stapled in position. Asphalt cement is applied and a strip of webbing -- C, is embedded. Apply cement and nail gravel strip in position every 4". Apply cement and cover with another strip of webbing. Next apply a 24" wide strip -- D, and as many plys of 36" felt -- E, as job requires. (Brann, 1974, 64)



# Ill.	terms
102	#15 felt, starter strip, webbing, eave fascia gravel stop, gravel
103	eave fascia gravel stop

Exercise 7

Identify the illustrations and terms in Figure 15, then in the two remaining illustrations (Figures 16 and 17).

Ill.#	terms

(From Figure 16)

Ill.#	terms

(From Figure 17)

Ill.#	terms

Figure 15: Flush Ceiling Framing

In many house designs, the living room and the dining or family room form an open "L." A wide, continuous ceiling area between the two rooms is often desirable. This can be created with a flush beam, which replaces the load-bearing partitions used in the remainder of the house. A nail-laminated beam, designed to carry the ceiling load, supports the ends of the joists. Joists are toenailed into the beam and supported by metal joist hangers (fig. 41,A) or wood hangers (fig. 41,B). To resist the thrust of the rafters for longer spans, it is often desirable to provide added resistance by using metal strapping. Strapping should be nailed to each opposite joist with three or four eightpenny nails. (Anderson & Winslow, 1976, 42)

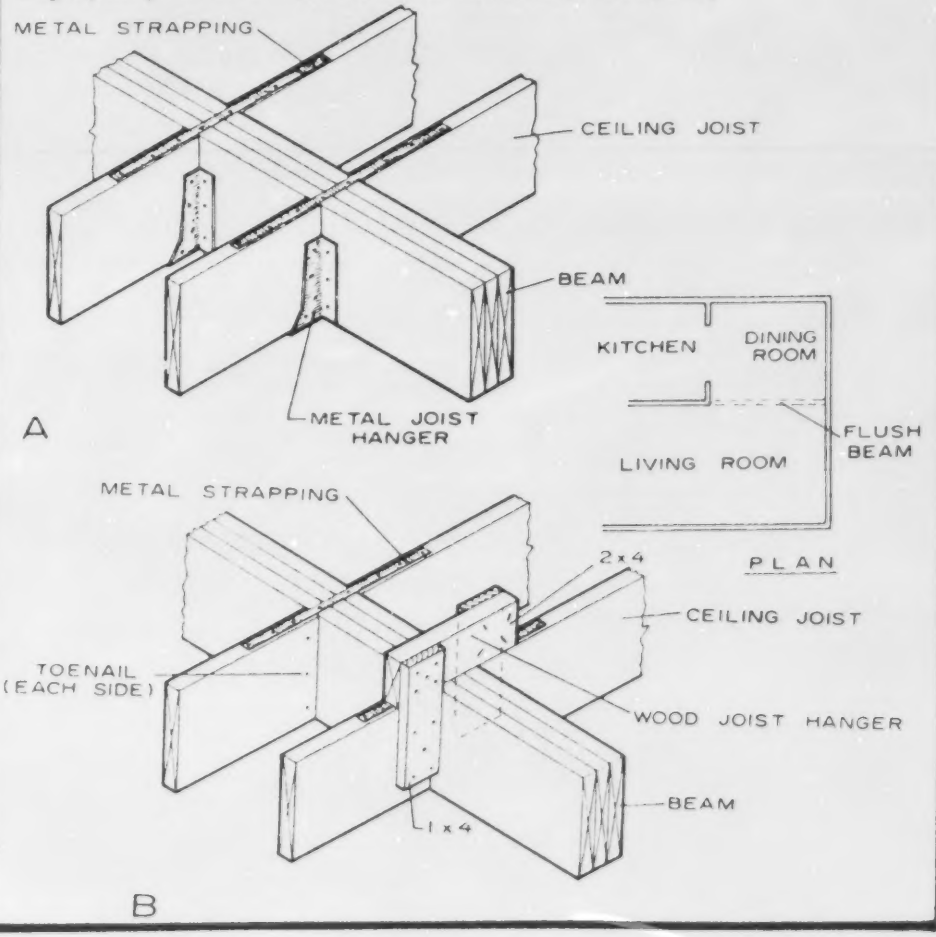


Figure 16: Coursing

In general, the conventional course (straight row) design is preferable to the staggered (or brick)design:
(Montgomery Ward, 6)

CONVENTIONAL DESIGN

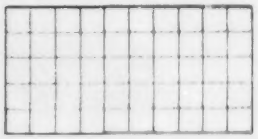


Illustration 2

STAGGERED DESIGN

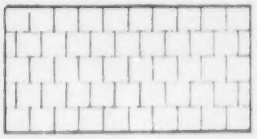


Illustration 3

Figure 17: Adhesives

There are numerous panel adhesives available. Most are packed in cartridges for application with a caulking gun, figure 11-10. Because of the number of available adhesives, it is advisable to follow the specific manufacturer's instructions. (Ball, 1975, 95)

Fig. 11-10 Caulking Gun

Carpenters must often consult blueprints and other diagrams conveying work instructions. Generally, these utilize symbols which are either defined in a legend or which the carpenter is expected to already know. In either case, students should become adept at translating symbols.

Exercise 8

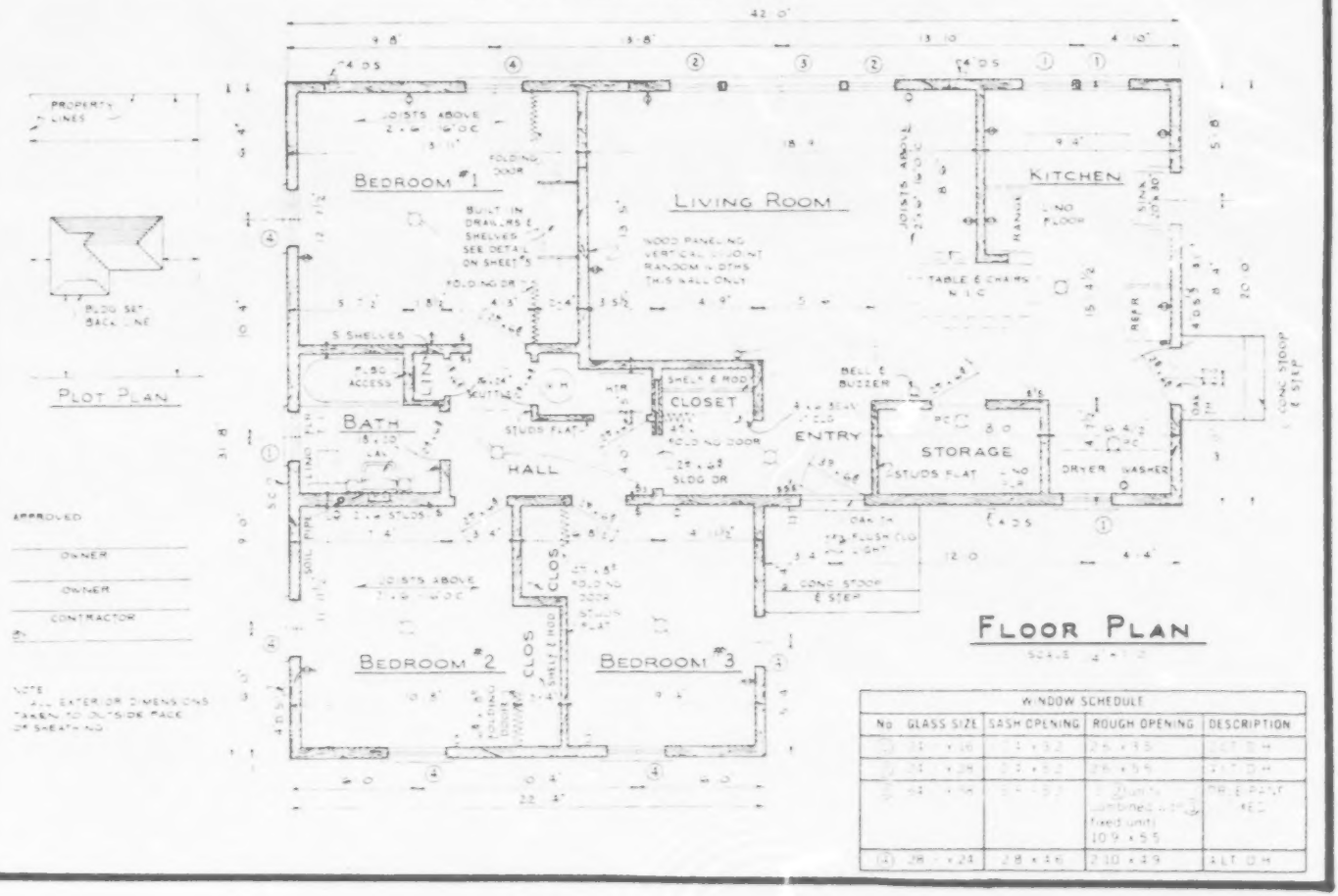
Below in Figure 18a is a list of common electrical symbols (Wagner, 1979, 83) and a house plan (Figure 18b) (Feier & Hutchings, 1976, 604). Circle and define in the margin five electrical symbols used in the plan. (Such an exercise can be done in class with transparencies or dittos).

Glossaries

Many current carpentry texts include glossaries at the end of the chapter or book. The teacher's task is to make sure the students use this aid. In the initial weeks of a course students can be required to read the glossary the night before beginning a new chapter. Initially, as they read the chapter and encounter a new word defined in the glossary they can note it on a separate piece of paper. While the notation is not important in itself, the requirement of writing it will force them to actively use the glossary. This requirement and the assigned previewing can be relaxed later in the term.

Figure 18a: Electrical Symbols

Figure 18b: House Plans



Educated Guessing

Sometimes an author makes the meaning of the word clear, but doesn't actually define it. More frequently, a term is defined once early in the book, but will be used later without definition. Students may not remember the initial definition. Encourage them to skip a word they don't know, read the surrounding sentences and then make an educated guess as to its meaning. This guess can be checked and refined as the word is used again. Students reading the following excerpt (U.S. Dept. of Agriculture, 1967, 18) might not understand the word "noncombustible." However, there are clues (see underlined phrases) which suggest that the word has something to do with fire. This guess is then verified by the final sentence.

> Crop driers are fire hazards if they are improperly installed or operated. They should be installed in accordance with NFPA Code on Crop Driers. When existing storage is used for drying crops, the drier should be connected to the crib or bin by a noncombustible duct at least 10 feet long. Permanent, fire-resistant, complete drying units should be located at the distance from other buildings that is specified by insurance companies involved.
>
> Many farms are equipped with feed grinding and processing plants. These plants become very dusty, and are subject to the same hazards as grain elevators and feed mills. This hazardous dusty situation requires the installation of dusttight wiring and equipment and totally enclosed motors to prevent any spark from being exposed to fine dusty materials. Fine dust is a highly combustible material that will explode and burn with the same aspects as volatile fuels.

Exercise 9

In the sample paragraphs below an important word, one that might not be readily comprehended by students, is circled. Underline other words that might help you ascertain its meaning.

> Before repainting, the probable cause of the trouble should be ascertained. If it is due to springtime blistering on localized areas on the house in the colder northern states, a more effective (vapor) barrier is needed. This can be obtained by painting the indoor side of the exterior walls. Two coats of aluminum paint plus two coats of decorative paint are best for sand-finish plaster. On smooth plaster, a primer-sealer and at least one coat of semigloss paint make a good barrier. Shutting off humidifiers will also help. (U.S. Dept. of Agriculture, 1973, 13)

> When an exposed block foundation is used as a finished wall for basement rooms, the stack bond pattern may be employed for a pleasing effect. This consists of placing blocks one above the other, resulting in continuous vertical mortar joints. However, when this system is used, it is necessary to incorporate some type of joint reinforcing every second course. This usually consists of small diameter steel (longitudinal) and cross rods arranged in a grid pattern. The common bond does not normally require this reinforcing, but when additional strength is desired, it is good practice to incorporate this bonding system into the wall. (Anderson & Winslow, 1976, 10)

Exercise 10: Textbook Application

Select an introductory chapter from the vocational text you teach. Look for the vocabulary comprehension aids introduced above.

Formal Definitions

Pg. #	Term	Clue word	Definition
1			
2			
3			
4			

Synonyms

Pg. #	Term	Definition
1		
2		
3		
4		

Illustrations

	Pg. # term	Pg. # Ill.	Terms defined by the drawing or photograph
1			
2			
3			
4			

Glossary

	Pg. #	Terms found in the glossary (use each term only once)
1		
2		
3		
4		
5		
6		

Educated Guessing

Pg. #	Term	Clues
1		
2		
3		
4		

Teaching Students Vocabulary Skills

Vocabulary skills can be introduced in the two weeks of class. Every-other-day one skill can be explained and an example given. Three or four more examples can be given on a transparency, ditto, or the board while the class locates the term and definition in a discussion. As part of their regular homework assignment, have students practice these skills. Select five words that you know are explained by the skill taught that day (synonym, formal definition, etc.). Have students prepare a sheet similar to the one you completed in the preceeding text application section for formal definitions, synonyms, illustrations, and glossaries. It is more effective, though, for work on educated guessing to be done in class discussions.

The cloze technique can also be used to reinforce or check the basic vocabulary skills. Prepare a clozed selection from your text, omitting important technical terms that are explained by one of the techniques discussed. This can be used to determine whether students use these comprehension aids or know the vocabulary. It can also be used to demonstrate to them the usefulness of learning these skills.

SECTION 4
PARAGRAPH COMPREHENSION

Section 4

PARAGRAPH COMPREHENSION

A paragraph has three major components:

1) the subject (what is being talked about)

2) the main idea (the most important information about the subject)

3) the supportive information (facts or examples that make the information clearer)

Of course, the main idea is the most crucial, for the key points of a chapter or article are simply selected main ideas from component paragraphs.

Look at the following paragraph; what are its subject and main idea?

> Redwood is an excellent insulator against heat and cold. And, because the heartwood contains no volatile resins, it is highly rated for its resistance to fire and flame spread. In fact, this property allows it to be used in construction of heat resistant safes and fire walls between commercial and industrial buildings. (California Redwood Association, 1968, 1)

At first it appears that the subject of this paragraph is "redwood as insulation." However, closer inspection shows that that is only one specific example of how redwood responds to heat and cold. The subject is actually "redwood and temperature" while the main idea, the most important information about this subject, is "redwood is highly resistant to heat and cold." The other specifics about insulation, resin, and construction uses simply provide supportive information.

Paragraph Subject

The key to finding the subject of a paragraph is finding the one topic that everything else in the paragraph is related to. A paragraph usually discusses only one small aspect of a larger topic, therefore, the subject must not be too general. It must identify the specific topic being discussed. At the same time, it must not be too specific, substituting an example of the subject being discussed for the subject itself.

Exercise 11

Read the following two paragraphs on oak floors (National Oak Flooring Manufacturers Association, 1971, 3, 4). In each case many specifics about oak flooring are given, each of which could easily, and incorrectly, be chosen as the subject. Students could also read the selections uncritically and choose "oak floors" as the subject, which is much too general. Instead, the subject must be inferred from the supportive information given.

> Oak flooring, despite its long history, is a truly modern product and is available in a wide variety of styles, grades, sizes and finishes. The basic types of oak flooring are strip, plank, unit block and parquet. Its cost depends on the type selected, grade, whether it is plain or quartersawed, and whether or not it is pre-finished at the factory.
> Subject _____

During its lifetime, oak is almost completely immune to signs of age, sunlight and temperature. Oak flooring does not harden when cold, nor soften when warm. Because it is scientifically kiln-dried, it adapts itself to the air's moisture content, reducing the possibility of expansion or shrinkage to a minimum.
Subject _____

Paragraph Main Idea

Often it is difficult to identify a paragraph's main idea. The following four guidelines can help in its location:

1. If the paragraph includes the definition of a term, that term might be part of the subject. The definition might be part of the main idea.

2. If there are examples, these may be illustrating all or part of the main idea.

3. If a key word or phrase is repeated, it might be part of the subject or main idea.

4. Highlighted terms might be part of the subject or main idea.

Note that the word "might" is used in each instance. These guidelines can point toward possible main ideas they cannot automatically select the right one.

Exercise 12

Look at the following four paragraphs. First ask yourself what the paragraph is about (the subject). Then look for the main idea using the three guidelines. Note which guidelines (if any) are most helpful in each case.

Redwood is far more durable than any finish yet developed, and a finish need not be used to protect it. You can leave a fence unfinished, to weatherbleach ultimately to a driftwood gray; you can apply annual coats of water repellent to help stabilize the color at a buckskin tan; you can bleach the wood for a quicker driftwood gray effect than natural weathering can accomplish; you can stain the fence with either a lightbodied, penetrating stain (does not obscure the grain of the wood, but presents a uniform appearance) or a heavy-bodied stain (obscures the grain but not the texture). Do not use varnishes or other clear, film-forming finishes on exterior wood. Such a finish deteriorates quickly, and refinishing is difficult and expensive. (California Redwood Association, 1973, 21)

Guideline #	Subject	Main Idea

Gutters, or eaves troughs, are used to collect and divert water away from eaves lines and foundation systems. Gutters are usually made of metal or plastic and are available in a wide variety of styles and sizes. At one time, molded wood gutters were frequently used, but for economic reasons the metal gutter has now replaced the wooden gutter in popularity. (Ball, 1975, 36)

Guideline #	Subject	Main Idea

Open stairs permit rapid spread of heat, smoke, and fire because they act as chimneys for hot, gas-laden air to rush from the lower to the upper floors. They are especially dangerous in spreading fire if their base is in a hall or room having wide, doorless openings into other rooms. Open stairways and wide, doorless openings between the stair hall and other rooms are often desirable to make an attractive arrangement of rooms. For fire protection, however, it is desirable to have openings leading from the stair hall provided with doors. A closed hall may also help to conserve heat in winter. (U.S. Dept. of Agriculture, 1967, 7)

Guideline #	Subject	Main Idea

A dormer is a framed structure projecting above a sloping roof surface, and normally contains a vertical window unit. Although its chief purpose is to provide light, ventilation and additional interior space, it should also enhance the exterior appearance of the structure. (Wagner, 1979, 175)

Guideline #	Subject	Main Idea

The following segment from Feirer & Hutchings (1976, 354-356) contains four paragraphs. Space is provided for you to note the subject and main idea for each paragraph.

Headers

Where windows or doors occur in outside walls or partitions, parts of some studs must be cut out. It is necessary, therefore, to install some form of headers over the doorway to support the lower end of studs that have been cut. Likewise, at the bottom of a window opening the "rough sill" supports the upper ends of studs that have been cut. ... The width of a header is determined by the length of the opening it must span. This information will be available from the building plans or local code requirements. ...

Headers are sometimes built-up trusses.... In some cases 4" stock is used rather than two pieces of 2" material nailed together. This saves work and also allows the thickness of the header to be exactly the same as the width of a 2" x 4" stud. ... (When two 2" members are used for a header, the total thickness is only 3". This requires a ½" spacer to give the header the full 3½" width of the stud.) ...

Framing wide openings such as double garage doors which require headers 16' to 18' long can be done with nailed plywood box beams. These headers can be fabricated on or off the building site. The design and construction of these headers is shown in Fig. 25-31d. The ends of the headers should be supported on studs or by framing anchors, depending on the local code requirements. ... The header lengths are obtained by measuring the layout of the bottom wall plates. The header is measured between the full studs. ... In the case of the header for the door shown in Fig. 25-14a, the header length would be 37 3/4".

It is best to number the openings (such as windows, doors, and fireplaces) for identification and then make a cutting schedule for all headers. One person can cut these to length and, if 2" material is used, nail them together. Use 16d nails, two near each end, and stagger the others 16" apart along the length of the header.

Don't forget to use 1/2" spacers between the 2" members where the nailing occurs. Headers are then distributed to their locations on the subfloor in readiness for the assembly of the wall sections.

Subject	Main Idea

Paragraph Comprehension and Illustrations

Paragraph comprehension can be reinforced by the proper use of illustrations. Carpentry illustrations often demonstrate a process or provide detailed information on building requirements or techniques. In either case, students must learn to first read the prose and then read the diagram, comparing each feature of the illustration to the related portion of prose. Comprehension and retention of the information provided by the diagram is facilitated if they summarize the illustration in their own words.

Exercise 13

Summarize the following two illustrations.

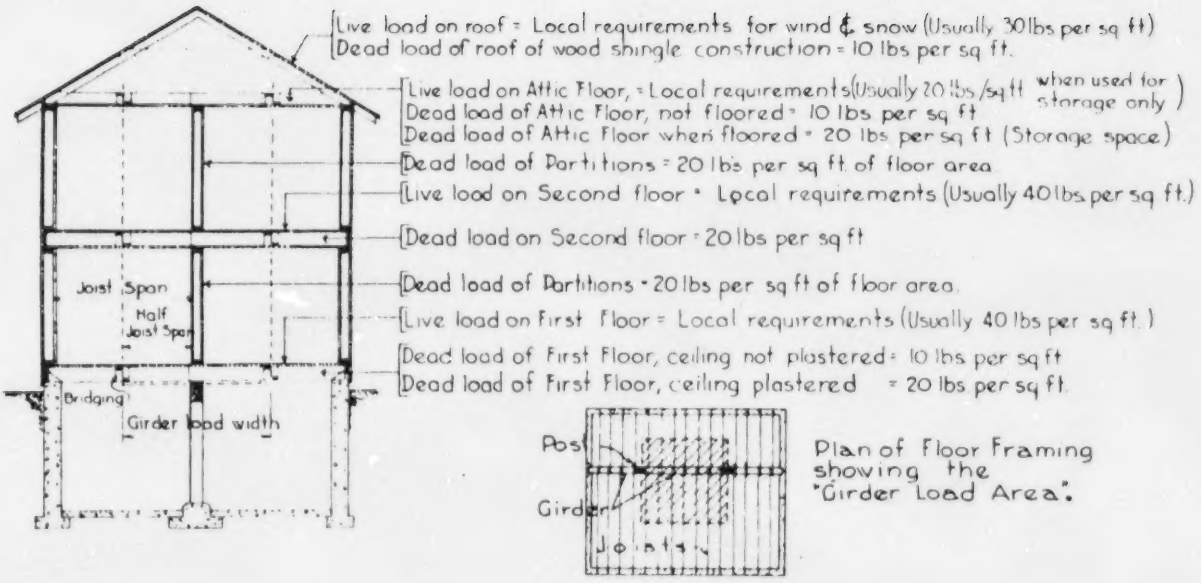
After you have made these preliminary decisions, you can determine the EXACT area to be tiled, through use of a "layout stick" -- the purpose of which is to minimize the amount of wasted tile by eliminating as many cut tiles as possible.

Obtain a long piece of wood -- such as a yardstick -- and mark off 4¼" segments ... representing tile size. If you have tile samples, you could lay the samples beside the wood and mark the segments in accordance with the tile itself.

Now locate the lowest place in the floor of the wall you plan to measure. Place the layout stick at this point and measure up to the exact height of the tile placement. this will show you exactly how many rows of tiles you will need for that wall. (Montgomery Ward, 1974, 2)

Summary Statement:

To determine the size of a girder, it is necessary to: 1. Find the distance between girder supports (span). 2. Find the girder load width. A girder must carry the weight of the floors on each side to the mid-point of the joists which rest upon it. 3. Find the "total floor load" per square foot carried by joists and bearing partitions to girder. This will be the sum of loads per square foot listed in the diagram, Fig. 7-8, with the exception of the roof loads which are carried on the outside walls unless braces or partitions are placed under the rafters, in which case a portion of the roof load is carried to the girder by joists and partitions. (Wagner, 1979, 116)


Live load on roof = Local requirements for wind & snow (Usually 30 lbs per sq ft)
Dead load of roof of wood shingle construction = 10 lbs per sq ft.
Live load on Attic Floor, = Local requirements (Usually 20 lbs/sq ft when used for storage only)
Dead load of Attic Floor, not floored = 10 lbs per sq ft
Dead load of Attic Floor when floored = 20 lbs per sq ft (Storage space)
Dead load of Partitions = 20 lbs per sq ft of floor area
Live load on Second floor = Local requirements (Usually 40 lbs per sq ft.)
Dead load on Second floor = 20 lbs per sq ft
Joist Span
Half Joist Span
Dead load of Partitions = 20 lbs per sq ft of floor area.
Live load on First Floor = Local requirements (Usually 40 lbs per sq ft.)
Dead load of First Floor, ceiling not plastered = 10 lbs per sq ft
Dead load of First Floor, ceiling plastered = 20 lbs per sq ft
Bridging
Girder load width
Post
Girder
Joists
Plan of Floor Framing showing the "Girder Load Area".

Summary Statement:

Exercise 14: Textbook Application

Pick four paragraphs from your fourth week's reading assignment. Identify the subject in each.

	Page #	Column #	Paragraph #	Subject
1				
2				
3				
4				

Pick four paragraphs from your fifth week's reading assignment. Identifying the subject and main idea in each.

	Pg. #	Col. #	Para. #	Subject	Main Idea
1					
2					
3					
4					

Pick a segment at least four paragraphs in length from your sixth week's reading assignment and note the subject and main idea of each important paragraph.

Pg. #	Subject	Main Idea

Pick two illustrations that clarify the meaning of a paragraph from the fifth, sixth, or seventh week's assignment. Note the page number of the diagram and write a brief summary statement about it.

Pg. # Diagram	Summary Statement

Teaching Students to Understand the Paragraph

Understanding the paragraph is the most difficult reading skill the carpentry instructor must teach. It is important to introduce the material slowly and incrimentally as was done here. The fourth week of class can be devoted to the paragraph subject. Monday 5-10 minutes can be spent in a general introduction and discussion/ practice locating subjects in simple sample paragraphs. Wednesday the three criteria can be applied to more sample paragraphs and students can look for the subject in specified paragraphs from the homework reading. Friday a few of the homework paragraphs can be discussed and one or two more complex samples given. Friday's homework can include 1-3 more paragraph assignments.

During week six, a similar procedure can be utilized to teach locating the main idea. Each day one of the four clues can

be introduced and applied along with the more general directions of "what is the most important thing the author is saying in this paragraph." The paragraphs you identified in the text application can be assigned to the students with directions to find the subject and main idea. In the sixth week the class can be assigned the multiparagraph sections you identified, recording the subject and main idea just as you did. They can also practice integrating the reading of illustrations and prose.

SECTION 5
EFFECTIVE READING TECHNIQUE

Section 5: Effective Reading Technique

In all subjects, the time comes when we ask our students to study by themselves. In many instances, these students do not know how to study. This section contains a brief overview and modification of a study technique originally devised by Francis Robinson.

The SQ4R Method of Study

Many elementary, secondary, and college students have not learned how to study a textbook assignment. A typical procedure is for the student to do nothing more than open his book and read the assignment. The more conscientious may follow this initial reading by a second or even a third reading of the same fruitless type. Research has found a good method of helping the student read a given selection with better understanding and better recall. It is called the SQ4R method. It involves six basic steps: (1) Survey, (2) Question, (3) Read, (4) Record, (5) Recite, (6) Review. Some of the things to be done in each of the six steps are discussed under appropriate headings below.

Survey:

> Look through the whole assignment. Read the headings if there are any; read the summary if there is one. Try to get the general idea of the content of the whole lesson. Later you can place the details into the framework which you have in mind, and the entire lesson will mean more.

Question:

Think of the questions which are likely to be answered in the lesson. Often the headings can very easily be turned into questions. Use them! If any heading does not tell you plainly what question is to be answered in that section use this question: "What does the author expect me to learn about from studying this section?" If there are no paragraph headings, skim the section quickly for the main ideas.

Read:

Study the lesson to find the answers to the questions. Do not stop to read every word carefully, concentrate on finding the main point. You cannot remember all the facts you find, so you want to look for the important ones, of which there will be only one or two for each section. Don't pick out too many. Do not try to memorize the facts at this point; just sort out the ones you need as you go along.

Record:

Make study guides. Fold or rule a large-sized notebook paper lengthwise down the middle. On the left, list the topics discussed in the book. If there are paragraph heading in boldface type, use them. If not, list the main ideas found in the preliminary survey. Leave space between topics. When you have finished reading a section and picking out the one or two points to remember, list on the right the key words of the ideas or facts you have decided are most important for each topic. Do not do this until after you have read a section and thought about it. This is most important.

Recite:

Go back over the lesson immediately. Cover the right hand side of the paper and check the headings on the left. Ask yourself, "Do I remember what this section was about?" or "Can I answer this question?" If you find that you cannot you know that you must look at the key words, or even go back to the book if necessary, in order to restudy the particular part which you did not understand or have forgotten. Step 4 is very important. Giving yourself an immediate quiz on what you have just studied is the best possible way to prevent forgetting.

Practice until you can recite on the entire study guide without referring to the key words. Then practice some more. This extra practice is what really pays off.

Review:

Some time later, and always before an exam, go back to your headings and questions and quiz yourself. Reread only those parts which you have forgotten. If you have taken steps 1, 2, 3, 4, 5, and 6 faithfully, you will find that you do not have too much to restudy.

If students learn to change the heading within a chapter to questions and then read to answer those questions, much more will be obtained, than if they merely read and then answered questions at the end of the chapter. Indeed, what often takes place when we assign questions from the chapter ending is students read the questions and then copy only that information which answers the question without ever having read the chapter or designated pages. The process of formulating questions is a thinking exercise which tunes students into the assignment. Reading, studying, in this way is a life-long skill that really should be taught. As a skill, it may be more important than the content and concepts of the subject. (Robinson, 1970)

Exercise 15: Textbook Application

Select a portion of the chapter you assign in the seventh of eighth week of class and practice the SQ4R method.

Teaching SQ4R

Students have already learned how to locate the subject and main idea of a paragraph and how to distinguish these from information that is merely supportive. In the final "paragraph" assignments they practiced recording information in much the same manner as they will for SQ4R. This should facilitate SQ4R instruction. On Monday explain surveying and have the students practice in class on the chapter currently assigned. Wednesday have them prepare questions from some of the headings, either individually or as a group. They can continue this exercise for homework. Friday the read and record steps can be presented and compared with the subject/main idea work they have already done. Reading and recording can be practiced on the homework assignment and disucssed the following Monday.

Teacher-made notes on the reading can be shown on a transparency, on the board, or a ditto to allow students to check their own notes. Wednesday the recite and review steps are introduced with students pairing-up to quiz each other from the left-hand subject column. Beginning Wednesday night, they should be expected to utilize the SQ4R method on their assignments. The next two Fridays, and sporatically thereafter, students can quiz each other on their notes while the instructor walks around the room noting whether each student has followed the correct procedure.

At the beginning of the next chapter, students should again be required to perform the survey step in class and suggest some guide questions derived from the chapter headings. Review of the other steps should take place as needed.

SECTION 6
RECOGNIZING AND RECORDING COMPLEX INFORMATION

Section 6

Recognizing and Recording Complex Information

Carpentry literature often highlights three important logical relationships: classification, comparison, and causality. Classification, in its simplist form is simply listing.

> The most desirable properties in a vapor barrier to be used under a concrete slab are: a) Good vapor - transmission rating (less than 0.5 perm); b) resistance to damage by moisture and rot; c) ability to withstand normal usage during pouring operations. (Anderson & Winslow, 1976, 17)

Comparison and causality are straightforward and commonplace. One author compares hardwoods and softwoods while another discusses common problems that occur when laying foundations, emphasizing their possible causes. These three relationships are easiest to see and remember if the notes taken about them have a visual impact. Each of these charting techniques is given below.

Classification

The use of classification can be signaled by a colon(:), number or letters, or words such as "these include." At other times classification is simply introduced by a statement: "there are a number of types of concrete." Outlining is the easiest way to record classification.

ELEMENTS OF DRAWING

A drawing consists of lines, dimensions, symbols, and notes. Lines show the shape of a product and include many details of construction. Fig. 3-8. Dimensions are numbers that tell the sizes of each part as well as overall sizes. The craftsman must follow these dimensions in making the materials list and the layout. Symbols are used to represent things that would be impractical to show by drawing, such as doors, windows, electrical circuits, and plumbing and heating equipment. Fig. 3-9. Some drawings also contain notes or written information to explain something not otherwise shown. Frequently in these notes abbreviations are given for common words (Feirer & Hutchings, 1976, 36).

Elements of a Drawing

A. Lines (shape and construction details)

B. Dimensions (sizes)

C. Symbols (represent complex things)

1. windows, doors, plumbing, etc.

D. Notes (written information and abbreviations)

More complicated classification can be presented with the use of a more detailed outline,

I. _____

A. _____

1. _____

a. _____

2. _____

a. _____

B. _____

Exercise 16

On a separate piece of paper construct such an outline of this selection from Feirer and Hutchings (1976, 103-104).

STRUCTURAL INSULATING BOARD

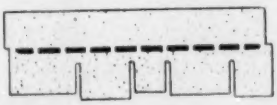
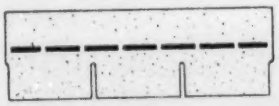
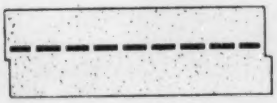
Most structural insulating board is made from wood fibers. It comes in two grades - sheathing and insulation.

There are two types of sheathing-grade insulation board. In one type all the surfaces and edges are covered with asphalt. In the other type the fibers are impregnated with asphalt during manufacture. These boards usually come in 4' x 8' sheets, 25/32" thick. They also come in 2' x 8' sheets. Sheathing grade is used for insulation and sound control as well as for structural sheathing.

Insulation grade is made in decorative panels, decorative ceiling tile, V-notched plaster base, and roof insulation. The standard thicknesses of this type of board are 1/2", 5/8", 3/4", or 1", although thicker boards up to 2" to 3" for roof insulation are also made. Sometimes thicker board is made by using an insulating board in the middle and a 1/4" hardboard on both surfaces. Ceiling tiles are made in a wide variety of sizes with tongue-and-groove edges, and with a choice of finishes. They are also made with a series of small holes to improve the sound control. Ceiling tile can be cemented, clipped, stapled, nailed, or interlocked in place. Acoustical tile absorbs up to seventy percent of the noise in a room.

Comparison

While classification is commonly used in carpentry literature, it is seldom used alone. Once the elements of a topic have been classified into sub-topics, these sub-topics are usually compared. Charts with the topics to be compared along one axis and the features of comparison along the other facilitate retention and

PRODUCT	Configuration	Per Square			Size		Exposure	Underwriters' Listing
		Approximate Shipping Weight	Shingles	Bundles	Width	Length		
Wood Appearance Strip Shingle More Than One Thickness Per Strip Laminated or Tab Applied	Various Edge, Surface Texture & Application Treatments	285# to 390#	67 to 90	4 or 5	11-1/2" to 15"	36" or 40"	4" to 6"	A or C - Many Wind Resistant
Wood Appearance Strip Shingle Single Thickness Per Strip 	Various Edge, Surface Texture & Application Treatments	Various 250# to 350#	78 to 90	3 or 4	12" or 12-1/4"	36" or 40"	4" to 5-1/8"	A or C - Many Wind Resistant
Self-Sealing Strip Shingle 	Conventional 3 Tab	205# - 240#	78 or 80	3	12" or 12-1/4"	36"	5" or 5-1/8"	A or C - All Wind Resistant
	2 or 4 Tab	Various 215# to 325#	78 or 80	3 or 4	12" or 12-1/4"	36"	5" or 5-1/8"	
Self-Sealing Strip Shingle  No Cut Out	Various Edge and Texture Treatments	Various 215# to 290#	78 to 81	3 or 4	12" or 12-1/4"	36" or 36-1/4"	5"	A or C - All Wind Resistant
Individual Lock Down Basic Design	Several Design Variations	180# to 250#	72 to 120	3 or 4	18" to 22-1/4"	20" to 22-1/2"	-	C - Many Wind Resistant

(Wagner, 1979, 188)

are often provided by the author. If not provided, students can construct their own, making sure to read the complete comparison section before constructing their chart.

Exercise 17

Construct a chart for the following selection (Anderson & Winslow, 1976, 101-103).

FLEXIBLE INSULATION

Flexible insulation is manufactured in two types, blanket and batt. Blanket insulation (fig. 95,A) is furnished in rolls or packages in widths suited to 16- and 24-inch stud and joist spacing. Usual thicknesses are 1½, 2, and 3 inches. The body of the blanket is made of felted mats of mineral or vegetable fibers, such as rock or glass wool, wood fiber, and cotton. Organic insulations are treated to make them resistant to fire, decay, insects, and vermin. Most blanket insulation is covered with paper or other sheet material with tabs on the sides for fastening to studs or joists. One covering sheet serves as a vapor barrier to resist movement of water vapor and should always face the warm side of the wall. Aluminum foil or asphalt or plastic laminated paper are commonly used as barrier materials.

Batt insulation (fig. 95,B) is also made of fibrous material preformed to thicknesses of 4 and 6 inches for 16- and 24-inch joist spacing. It is supplied with or without a vapor barrier. One friction type of fibrous glass batt is supplied without a covering and is designed to remain in place without the normal fastening methods.

LOOSE FILL INSULATION

Loose fill insulation (fig. 95,C) is usually composed of

materials used in bulk form, supplied in bags or bales, and placed by pouring, blowing, or packing by hand. This includes rock or glass wool, wood fibers, shredded redwood bark, cork, wood pulp products, vermiculite, sawdust, and shavings.

Fill insulation is suited for use between first-floor ceiling joists in unheated attics. It is also used in sidewalls of existing houses that were not insulated during construction. Where no vapor barrier was installed during construction, suitable paint coatings, as described later in this chapter, should be used for vapor barriers when blown insulation is added to an existing house.

REFLECTIVE INSULATION

Most materials reflect some radiant heat, and some materials have this property to a very high degree (4). Materials high in reflective properties include aluminum foil, sheet metal with tin coating, and paper products coated with a reflective oxide composition. Such materials can be used in enclosed stud spaces, in attics, and in similar locations to retard heat transfer by radiation. These reflective insulations are effective only when used where the reflective surface faces an air space at least 3/4 inch or more deep. Where a reflective surface contacts another material, the reflective properties are lost and the material has little or no insulating value.

Reflective insulations are equally effective regardless of whether the reflective surface faces the warm or cold side. However, there is a decided difference in the equivalent conductance and the resistance to heat flow. The difference depends on (a) the orientation of the reflecting material and the dead air space, (b) the direction of heat flow (horizontal, up, or down), and (c) the mean summer or winter temperatures. Each possibility requires separate consideration. However, reflective insulation is perhaps more effective in preventing summer heat flow through ceilings and walls. It should likely be considered more for use in the southern portion of the United States than in the northern portion.

Reflective insulation of the foil type is sometimes applied to blankets and to the stud-surface side of gypsum lath.

Metal foil suitably mounted on some supporting base makes an excellent vapor barrier. The type of reflective insulation shown in figure 95,D includes reflective surfaces and air spaces between the outer sheets.

RIGID INSULATION

Rigid insulation is usually a fiberboard material manufactured in sheet and other forms (fig. 95,E). However, rigid insulations are also made from such materials as inorganic fiber and glass fiber, though not commonly used in a house in this form. The most common types are made from processed wood, sugarcane, or other vegetable products. Structural insulating boards, in densities ranging from 15 to 31 pounds per cubic foot, are fabricated in such forms as building boards, roof decking, sheathing, and wallboard. While they have moderately good insulating properties, their primary purpose is structural.

Roof insulation is nonstructural and serves mainly to provide thermal resistance to heat flow in roofs. It is called "slab" or "block" insulation and is manufactured in rigid units ½ to 3 inches thick and usually 2 by 4 feet in size.

In house construction, perhaps the most common forms of rigid insulation are sheathing and decorative coverings in sheets or in tile squares. Sheathing board is made in thickness of ½ and 25/32 inch. It is coated or impregnated with an asphalt compound to provide water resistance. Sheets are made in 2- by 8-foot size for horizontal application and 4- by 8-feet or longer for vertical application.

MISCELLANEOUS INSULATION

Some insulations do not fit in the classifications previously described, such as insulation blankets made up of multiple layers of corrugated paper. Other types, such as lightweight vermiculite and perlite aggregates, are sometimes used in plaster as a means of reducing heat transmission.

Other materials are foamed-in-place insulations, which include sprayed and plastic foam types. Sprayed insulation is usually inorganic fibrous material blown against a clean surface which has been primed with an adhesive coating. It is often left exposed for acoustical as well as insulating properties.

Expanded polystyrene and urethane plastic foams may be molded or foamed-in-place. Urethane insulation may also be applied by spraying. Polystyrene and urethane in board form can be obtained in thicknesses from ½ to 2 inches.

Cause and Effect

Carpentry literature often seeks to teach students to diagnose and correct common construction problems. Such discussions are generally written in a cause and effect format. Again, a chart facilitates note-taking. In this case, causes are listed in one column opposite possible effects. The order of the columns is unimportant.

LUMBER DEFECTS

A defect is an irregularity occurring in or on wood that reduces its strength, durability or usefulness. It may or may not detract from appearance. For example, knots commonly considered a defect may add to the appearance of pine paneling. An imperfection that impairs only the appearance of wood is called a blemish. Some of the common defects include:

KNOTS: Caused by an imbedded branch or limb of the tree, Fig. 4-14. They are generally considered to be strength reducing - the amount depending upon the type, size and location, See Fig. 4-15.

SPLITS AND CHECKS: A separation of the wood fibers along the grain and across the annular growth rings. Usually occurs at the ends of lumber - a result of uneven seasoning.

SHAKES: A separation along the grain and between the annular growth rings. Likely to occur only in species with abrupt change from spring to summer growth.

PITCH POCKETS: Internal cavities that contain or have contained pitch in either solid or liquid form.

HONEYCOMBING: Separation of the wood fibers in the interior section of the tree. May not be visible on the surface of boards.

WANE: The presence of bark or the absence of wood along the edge of the board. It forms a bevel and reduces the width.

BLUE STAIN: A discoloration caused by mold-like fungi. Objectional in appearance in some grades of lumber but has little or no effect on strength.

DECAY: A disintegration of wood fibers due to fungi. Early stages of decay may be difficult to recognize. Advanced stages result in wood that is soft, spongy, and crumbles easily.

HOLES: Holes in lumber will lower the grade. They may be caused by handling equipment or by wood boring insects or worms.

WARP: Any variation from true or plane surface. May include any one or combination of the following: cup, bow, crook, and twist (also called wind). (Wagner, 1979, 57-58).

LUMBER DEFECTS

Defect	Cause	Result
Knot	imbedded branch or limb	strength reducing
Splits & Checks	uneven seasoning	separation wood fibers along grain across rings
Shakes	abrupt spring summer growth change	separation along grain between rings

LUMBER DEFECTS (CONT'D)

Defect	Cause	Result
Pitch pockets	cavities of solid or liquid pitch	-----
Honeycombing	separation of interior wood fibers	-----
Wane	bark or lack of wood on edge	reduces width
Blue Stain	fungi	discoloration
Decay	fungi	soft, spongy wood crumbles easily
Holes	equipment, insects	lower grade
Warp	off true surface	cup, bow, crook, twist

Exercise 18

Construct a chart from the following portion of a text section on "Correcting Common Paint Problems" (Feirer & Hutchings, 1976, 992-994).

CORRECTING COMMON PAINT PROBLEMS

By adhering to the recommendations in this unit, paint problems will be kept to a minimum. There are paint problems which may develop as a result of factors other than improper construction techniques.

Improper paint application can also cause problems. Described here are some of the paint problems resulting from poor construction techniques or improper paint application. The recommended corrective procedures are also given.

FLAKING OR CHALKING ON MASONRY

This problem is caused by inadequate surface preparation. The paint flakes off in scales or powders and chalks off. Fig. 50-18. This problem can be corrected by:

1. Removing flaking and charking paint by wire brushing or sandblasting.

2. Sealing all surface cracks from moisture with a concrete patching material or a good quality calking compound.

3. Applying a masonry conditioner according to the label directions.

4. Applying two top coats of latex house paint or exterior masonry paint according to label directions.

CRACKING AND ALLIGATORING

This problem is created in two ways. The previous paint film may have been applied in several heavy coats without sufficient drying time between coats, or the undercoater may not be compatible with the finish coat. Fig. 50-19. This problem can be corrected by:

1. Sanding smooth the cracked or alligatored surface.

2. Applying one coat of undercoater and one top coat of a recommended house paint according to label directions.

PEELING GUTTERS

Peeling or cracking on such surfaces as galvanized metal gutters and downspouts is caused by improper metal primer or no primer on the galvanized metal. The paint thus has little or no adhesion. Fig. 50-20. This problem can be corrected by the following method:

1. Strip off all loose paint with a scraper, wire brush, or, best of all, a power wire brush. It is very important that all loose paint be removed. If not, succeeding coats of paint will subsequently peel away too.

2. When finishing with an oil base top coat, prime the bare spots with a primer made for galvanized metal. When finishing with a latex top coat, apply it directly to the bare galvanized metal after cleaning with a solvent. Before applying the top coat, be sure to allow the solvent to evaporate.

3. Finish with a top coat of latex or oil base house paint. Apply two top coats when a color change is involved or substantial bare metal has been exposed.

CHECKING

Checking is caused by plywood veneer cracking from expansion and contraction as it weathers and ages. Fig. 50-21. This problem can be corrected by:

1. Sanding the surface smooth.

2. Spot priming the exposed bare wood and cracks with an exterior undercoater, if the cracked area is not extensive.

3. Filling the primed cracks with calk.

4. Applying a top coat of recommended house paint.

NOTE: Should this problem be extensive, the best procedure is to replace the plywood. To prevent checking on new plywood, sand the surface smooth and apply one coat of latex wood primer and two coats of latex house paint according to label directions.

Exercise 19: Textbook Application

Select 3 paragraphs or sections from the text assignments for weeks nine, ten or eleven that include each of the logical relationships discussed above and complete a note chart on them.

Classification:	Pg. #	Topic
	1.	
	2.	
	3.	
Comparison:		
	1.	
	2.	
	3.	
Cause and Effect:		
	1.	
	2.	
	3.	

Teaching Students to Recognize and Record Complex Information

Chart notetaking as demonstrated here can be introduced anytime after week six, whenever it is appropriate for your text. The three types of charts need not be presented at the same time. For convenience sake, it is assumed here that all will be introduced during weeks nine, ten or eleven. Each form should be presented on a separate day. If your text already presents charts or outlines of these types, the appropriate one should be presented first followed by one or two sample paragraphs or sections from which the students can construct charts as a class. Related homework assignments should be given as soon as the appropriate text selections are covered.

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